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Can You Move to Opportunity? Evidence from the Great Migration†

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This paper shows that racial composition shocks during the Great Migration (1940–1970) reduced the gains from growing up in the northern United States for Black families and can explain 27 percent of the region's racial upward mobility gap today. I identify northern Black share increases by interacting pre-1940 Black migrants' location choices with predicted southern county out-migration. Locational changes, not negative selection of families, explain lower upward mobility, with persistent segregation and increased crime and policing as plausible mechanisms. The case of the Great Migration provides a more nuanced view of moving to opportunity when destination reactions are taken into account. (*JEL* H75, H76, J15, J62, K42, N32, R23)

Childhood location has long run effects on adult outcomes. This fact has become the basis for "moving to opportunity" policies that aim to reduce poverty by moving families from disadvantaged neighborhoods to better ones (Chetty and Hendren 2018a, Bergman et al. 2019). Using arguably the largest natural experiment in "moving to opportunity" in US history, this paper assesses the general equilibrium effects of policies of this type.

Between 1940 and 1970, during the Great Migration,[1] four million African Americans left the US South, where they faced severe restrictions on their social, political, and economic rights under Jim Crow. They settled in urban areas in the

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[1] The first wave of the Great Migration took place between 1915 and 1930 and was substantially smaller, numbering approximately 1.5 million individuals and affecting fewer cities to a lesser degree. The focus of this study is the larger second wave of the Great Migration, which I refer to from here on out simply as "the Great Migration."

North and West of the United States, where racial hierarchies were substantially less pronounced. This massive population movement radically transformed the racial demographics of destination cities, prompting White flight from urban neighborhoods and potentially altering the policies of local governments (Boustan 2010, Tabellini 2018).

This paper shows that northern cities' responses to the Great Migration (also termed "Migration") ultimately reduced the gains from growing up in destination locations. The effects have been particularly detrimental for Black men. Those growing up in former Great Migration commuting zones (CZs) today have lower adult income than those from similarly resourced families, but in locations less affected by the Migration. The channel appears to be changes in the environment for families, rather than ex post sorting of negatively selected families into destinations. In response to Black migrant arrivals in the mid-century, White families withdrew from shared urban neighborhoods and public schools. By the late 1960s, riots broke out in Great Migration urban areas, and in the subsequent decades destination cities increased police spending, suffered from higher murder rates, and incarcerated a greater share of the population. Today, roughly 27 percent of the gap in upward mobility between Black and White families in the urban North can be attributed to changes induced by the Great Migration.

I draw on a large number of data sources to conduct the analysis in this paper. To establish the main results on upward mobility, I use the complete count US censuses from 1900 to 1940 and contemporary measures from Chetty and Hendren (2018b) and Chetty et al. (2020). To understand mechanisms, I assembled a new database on local government expenditures, private schools, crime, incarceration, and other characteristics of destinations spanning the period 1920–2015. I digitized or harmonized data on local government spending from the Financial Statistics of State and Local Governments and the Individual Government Finances data; data on schooling from the Biennial Survey of Education in the United States; urban murder rates from the Uniform Crime Reports; census reports on local county jail populations; and data on the county of commitment of federal and state prisoners from the Vera Institute of Justice's In Our Backyards database. This newly harmonized database is now available on my website for other researchers to use.

The empirical strategy makes use of the fact that Black southern migrants settled in northern cities where previous migrants from their communities had moved, giving rise to highly specific linkages between southern locations and northern destinations (Boustan 2010, Black et al. 2015, Stuart and Taylor 2021b). To address omitted factors that may codetermine increases in the urban Black population during the Great Migration and declines in upward mobility, I use a "shift-share" approach. I combine information on pre-1940 Black southern migrants' location choices with supply-side variation in county out-migration from 1940 to 1970, predicted from southern economic variables.[2] As the set of these variables is potentially large, I use a machine learning technique, least absolute shrinkage and selection operator (LASSO), to optimize the set of predictors of net migration rates from

[2] One example is variation in the share of agricultural land planted in cotton. Cotton mechanization accelerated after World War II, contributing to Black out-migration from the South (Whatley 1985); variation in cotton acreage thus provides plausible variation in southern county migration rates.

the South. Assigning inflows to cities according to historical settlement patterns yields the predicted increase in the Black population from southern variation alone, which I normalize by the initial 1940 urban population. Black in-migration is a right-skewed distribution, so I define the Migration shock to a CZ to be the percentile of predicted Black population increase.

Using this strategy, I show that the Migration led to a reduction in observed upward mobility in destination CZs in the North today. A one standard deviation larger increase in the historical Black population, approximately a 29-percentile increase in the shock, lowered adult income rank of children from low-income families by 3.6 percentiles, approximately an 11.3 percent drop in adult income. As a benchmark, a one standard deviation increase in residential racial segregation lowers adult income by about 5.2 percent (Chetty and Hendren 2018b).

Two potential mechanisms underlie this effect: selection, or changes in the characteristics of the average resident family; and location, or changes in local public goods or neighborhood quality. To disentangle these two channels, I use data on the childhood exposure effects of CZs from Chetty and Hendren (2018b). These data contain estimates of each CZ's causal effect on children's adult outcomes today. I examine whether the causal effect of a CZ varies with exogenous historical increases in the Black population. The interpretation is as follows: if an arbitrary child were to spend one additional year in a Great Migration CZ versus one less affected by the Migration, how does this affect his or her income as an adult? I estimate a robust negative effect of the Migration on this measure of upward mobility. My estimates suggest that the cumulative effect of spending one's entire childhood in a Great Migration city accounts for all of the negative impact of the Migration on observed upward mobility. In other words, I find no evidence that negative selection of families contributes to the association between historical racial composition shocks and declines in upward mobility.

Next, I explore which groups of children were affected by the Migration. The largest negative effects manifest for Black men, who earn less growing up in major Great Migration CZs compared to areas less affected by the Migration. I find much more muted effects on the earnings of Black women. This evidence is consistent with prior literature that finds that boys' outcomes are more responsive to family and environmental factors than girls' (Bertrand and Pan 2013). Marriage rates are also lower in Great Migration CZs. This, combined with the deleterious effects on Black men's earnings, contributes to reduced Black household income in destination locations.

To understand what characteristics of locations changed as a result of the Migration and thus potentially explain the Migration's persistent effect on upward mobility today, I use the data I assembled on local governments, schools, and crime in CZs from 1920 to 2015. I use the same empirical strategy described above to estimate the impact of the Great Migration on potential mechanisms over time. Pre-1940 outcomes serve as placebo checks. My analysis reveals significant and persistent increases in the following areas: the racial gap in public school enrollment, White suburban residence within the CZ, murder rates, and rates of incarceration. The late 1960s were a turning point. Race riots broke out across major American cities and were more severe in Great Migration CZs. The racial attitudes of voters in the late 1960s aligned more closely with southern segregationist political views.

Finally, local government responses to urban decline may have also exacerbated the racial gap in upward mobility. City governments on net increased spending on policing, but did not increase education, health, or infrastructure expenditures.

I rule out several alternative explanations for upward mobility reductions in Great Migration CZs. Many Black southerners moved to manufacturing centers during the 1950s and 1960s, and these may have undergone greater job loss due to deindustrialization. In all specifications, I control for the share of the labor force in manufacturing in 1940, which largely accounts for variation in manufacturing shares in subsequent decades. Results are also robust to including a Bartik instrument for employment changes using variation in industry composition interacted with national leave-one-out changes in industry-level employment between 1940 and 1970. Furthermore, I find much smaller, statistically insignificant effects of the Migration on White men from low-income families, a group that would have been strongly affected if the findings were driven by deindustrialization alone. What is more likely is that a restructuring of economic activity within Great Migration CZs left Black families in the urban core without adequate opportunities while White families potentially followed jobs by moving to growing suburban areas, a finding in line with the historical and sociological literature on this topic (Sugrue 1996, Wilson 1987).

I investigate the extent to which the results reflect responses to southern Black migrants specifically. White southerners also migrated to northern cities over the twentieth century. I instrument for White southern inflows and show that these have no effect on Black upward mobility or on the gains to growing up in specific CZs. Second, European mass migration affected many northern cities in the late nineteenth and early twentieth centuries. My results are robust to controlling for historical European migration into Great Migration destinations. To determine whether declines in upward mobility reflect fixed characteristics of locations with high Black population shares, I show consistent results using first-differenced measures of Black men's upward mobility, suggesting that changes in the racial composition, not simply the levels of the Black population or other immutable destination features, help explain the findings.

A large literature seeks to identify neighborhood effects and the impact of residential segregation and urban poverty on children's outcomes.[3] More recently, both experimental and quasi-experimental studies have shown childhood location to be an important determinant of adult outcomes and that substantial variation in these effects exists across the United States (Chetty, Hendren, and Katz 2016; Chetty and Hendren 2018a, b). However, the stability of these effects in response to shocks is much less understood. I show that large mid-century shifts in the racial composition of northern cities altered the effects locations had on children, turning high opportunity locations into opportunity deserts, particularly for Black families.

This paper provides a new, long-run intergenerational perspective on the Great Migration. Papers studying the contemporaneous effects of the Great Migration found largely positive impacts on migrants themselves, particularly in terms of income (Collins and Wanamaker 2014, Boustan 2016). An exception is Black et al.

[3] For literature on this topic, see Ananat (2011); Andrews et al. (2017); Cutler and Glaeser (1997); Massey and Denton (1993); Graham (2016); Sampson, Morenoff, and Gannon-Rowley (2002); Wilson (1987).

(2015) who find increased mortality and lower longevity of Black migrants in the urban North, relative to stayers from the deep South. To my knowledge, this is the first paper to consider the long-run impacts of the Great Migration on outcomes for the third generation living in the North.[4] The results of this study suggest that across the North, responses to the Great Migration worsened neighborhood environments. These changes were so dramatic that outcomes for the third generation in the North look no better today than for Black children growing up in the South.

An important component of the relationship between the Great Migration and intergenerational mobility that this paper does not speak to, however, is the causal effect of the Migration on the descendants of migrants themselves. The best estimates suggest that moving North nearly doubled the wages of migrants compared to those who stayed behind in the South (Boustan 2016). Thus, the children and grandchildren of migrants living in the North likely benefited from their parents and grandparents moving up in the national income distribution. Losses incurred through northern cities' responses to the Migration must be placed in context with overall improvements in Black economic status from moving North.

The rest of the paper is structured as follows. Section I gives an overview of the historical context. Section II describes the data sources, including on upward mobility and Black population change in northern cities, and provides some descriptive evidence on the relationship between the two. Section III describes my empirical strategy for identifying the causal impact of the Migration. In Section IV, I present the main results on upward mobility and on the contribution of selection versus location to these findings. In Section V, I present results on potential mechanisms behind the persistent effects of the Migration. Section VI concludes.

I. Historical Background

> *"My mother was my inspiration … she was one of those 6,000,000 Black people who left the South so that her children wouldn't have to grow up and put up with what she had to grow up and put up with."*
>
> —Helen Singleton, civil rights activist from Los Angeles.[5]

Starting in the 1910s, Black Americans migrated in large numbers from southern states to northern states, a phenomenon known as the Great Migration. By 1970, so many had moved that the percent of Black Americans living in the South fell to just over 50 percent, from around 90 percent in 1910. The Migration took place in two distinct waves, the first from around 1915 to 1930, with moves slowing considerably during the Great Depression, and the second from 1940 to 1970, the focus of the current study. After this, net flows of Black Americans reversed direction, with the South gaining more Black migrants than the non-South (Boustan 2016).

Before the 1960s and the ensuing changes ushered in by civil rights era activism and legislation, Black Americans faced significant limitations on their political, social, and economic freedoms in the US South (Wright 2013). Declining labor

[4] Leibbrand et al. (2019) consider the differences in neighborhood of residence at older ages between children of migrants in the North and those of nonmigrants in the South. The study concludes that the children of migrants live in better neighborhoods but that some of this difference can be explained by positive selection of the migrants.

[5] This quote is excerpted from a speech Singleton gave to Los Angeles high school students in 2012. Footage of the speech can be accessed here: https://www.youtube.com/watch?v=gEotBOdh9_0.

demand in southern agriculture gradually loosened the largely rural Black population's ties to the land. Further, job opportunities for Black workers opened up in many northern cities. As a result of these changes, Black migrants increasingly undertook the journey north. In doing so, they sought better lives for themselves and their children, and for many decades, the North appeared to deliver on this promise.[6]

Helen Singleton, the daughter of a migrant and later an activist in the civil rights movement, recalled her surprise hearing about *Brown v. Board of Education*, the US Supreme Court ruling that rendered segregated schooling unconstitutional. Having attended high school in Los Angeles, California, the concept of a segregated school was foreign to her. By contrast, for many Black children in the South, even those from educated families, the paucity of public Black high schools made secondary schooling very costly (Margo 1990, 1991). Singleton's experience was reflected more broadly in educational patterns for Black children across the United States in 1940.

Figure 1, panel A shows the fraction of Black teenagers from median-educated households who obtained nine or more years of schooling. The map illustrates stark differences in upward mobility for Black children in the North compared to the South. A major shift in the geography of upward mobility for Black Americans appears to have taken place in the decades after 1940.

Figure 1, panel B illustrates the current geographic distribution of Black upward mobility in the United States. Depicted in the map is average income rank for Black men and women who grew up in low income families in each CZ in the 2000s. Several northern locations that exhibited high outcomes for Black children in 1940 exhibit some of the worst outcomes for Black children today. The fact that the peak of the Great Migration took place in between motivates an empirical investigation of the Migration's role in the decline in Black upward mobility in the North.

II. Data and Descriptive Statistics

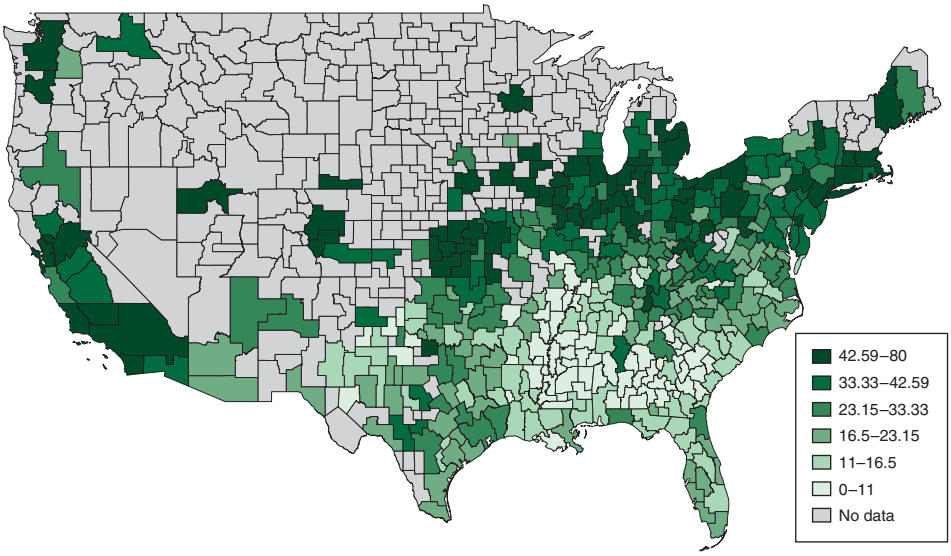
Documenting changes in upward mobility in Great Migration destinations requires both historical and contemporary measures of intergenerational mobility by location. I discuss the construction and sources for these measures below, followed by a description of the cities and CZs in the sample. More details on the data and sample are provided in online Appendices A and B.

A. *Upward Mobility*

Historical Upward Mobility.—To measure upward mobility in CZs prior to the 1940–1970 wave of the Great Migration, I use the Integrated Public Use Microdata Series (IPUMS) version of the 1900–1940 complete count US censuses (Ruggles et al. 2021). I calculate the fraction of teens attending school among low socioeconomic status fathers or the fraction of teens with nine or more years of schooling

[6] See Whatley (1985), Collins (1997), Hornbeck and Naidu (2014) for further discussion of the economic and political determinants of the Great Migration. For example, Collins (1997) shows how northern industrialists' hiring and recruiting Black workers hinged on reduced presence of and access to European immigrant labor due to World War I and immigration controls put in place in the 1920s. For an overview of the Migration's effects on Black workers' earnings, see Boustan (2016).

Panel A. Percentage Black teens in median-educ. families with 9-plus years of schooling, 1940



Panel B. Household inc. rank of Black individuals from below-median-income families, 2015

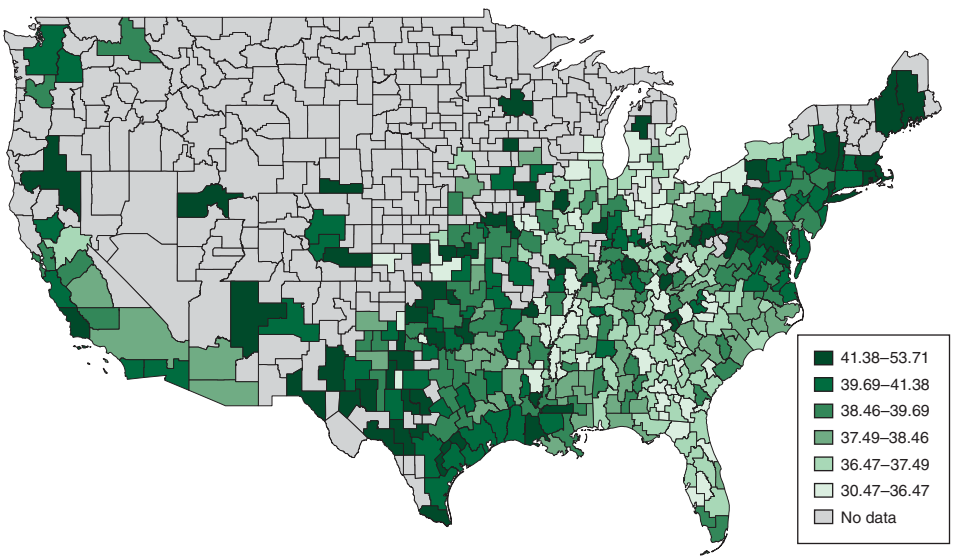


Figure 1. Black Upward Mobility in 1940 and 2015

Notes: This figure depicts Black upward mobility by CZ in 1940 and 2015. Panel A depicts Black educational upward mobility in 1940 defined as the percentage of 14-to-18-year-old boys and 14-to-16-year-old girls who have at least 9 years of schooling, from households where the most educated parent has between 5 and 8 years of schooling. Panel B shows expected mean household income rank in 2015 by childhood CZ for the 1978–1983 birth cohorts of Black men and women from families at the twenty-fifth percentile of the parent income distribution. Darker shades indicate CZs with higher levels of upward mobility.

Sources: IPUMS 1940 complete count census for panel A, measure following Card, Domnisoru, and Taylor (2018), and Chetty et al. (2020) for panel B

among parents with a median level of education for the United States at the time. Teenagers typically reside in the same households as their parents, obviating the

need to match them across censuses to observe parent economic status. At the same time, teenagers are old enough that their educational attainment is likely predictive of their adult educational attainment and future labor market outcomes. Observing outcomes for the near universe of enumerated teenagers reduces the scope for sampling bias in constructing upward mobility measures at fine geographies. Finally, teenager upward mobility can be constructed separately by race without differential selection bias across groups arising from lower name-based match rates for African Americans, who have fewer unique surnames as a legacy of slavery.

Contemporary Upward Mobility.—For modern measures of upward mobility, I use income upward mobility measures made publicly available by Chetty and Hendren (2018b) and Chetty et al. (2020), (downloadable at www.opportunityinsights.org). Based on the universe of federal income tax records from 1996 to 2012, these data contain measures of 1980s birth cohorts' income rank conditional on parent income rank. Measures are available separately for the twenty-fifth, fiftieth, and seventy-fifth percentiles of parent income and by race and gender group.

How comparable are educational upward mobility in 1940 and income upward mobility in the 2000s? Across CZs where both measures are available, the two are strongly correlated, with a correlation coefficient of 0.49. Additionally, income upward mobility is strongly correlated with high school graduation rates in low income families today, with a correlation coefficient of 0.65.

The cohorts whose outcomes I analyze primarily correspond to the grandchildren of the Great Migration generation. I'm unable to observe upward mobility for earlier cohorts due to lack of suitable data—neither post-1940 complete count census nor pre-1990s IRS (Internal Revenue Service) tax records are readily available. Instead, I assembled a new database of local public finance and neighborhood quality measures for CZs spanning the years 1920–2015, the details of which I describe in full in online Appendix E. My analysis of these data in Section V shows when cities began changing in response to the Migration, shedding light on whether earlier cohorts would also have been affected.

B. *Great Migration CZs: Sample, Measurement, and Descriptive Statistics*

My analysis sample consists of 130 non-southern CZs for which data on the urban Black population in 1940 and 1970 could be collected from the census and from the County and City Data Book 1944–1977 (CCDB). These CZs represent a significant share of both the overall population in the United States as well as the Black population, specifically. About 86 percent of the non-southern US population and 96 percent of the non-southern US Black population lives in one of these CZs. Online Appendix B provides more details on the construction of the sample.

I define Black population change in a CZ during the Great Migration as the 1940 to 1970 increase in the urban Black population as a share of the initial 1940 urban population:

$$\Delta \text{Black pop}_{CZ}^{1940\text{–}1970} = \frac{b_{\text{urban},CZ}^{1970} - b_{\text{urban},CZ}^{1940}}{\text{pop}_{\text{urban},CZ}^{1940}}, \tag{1}$$

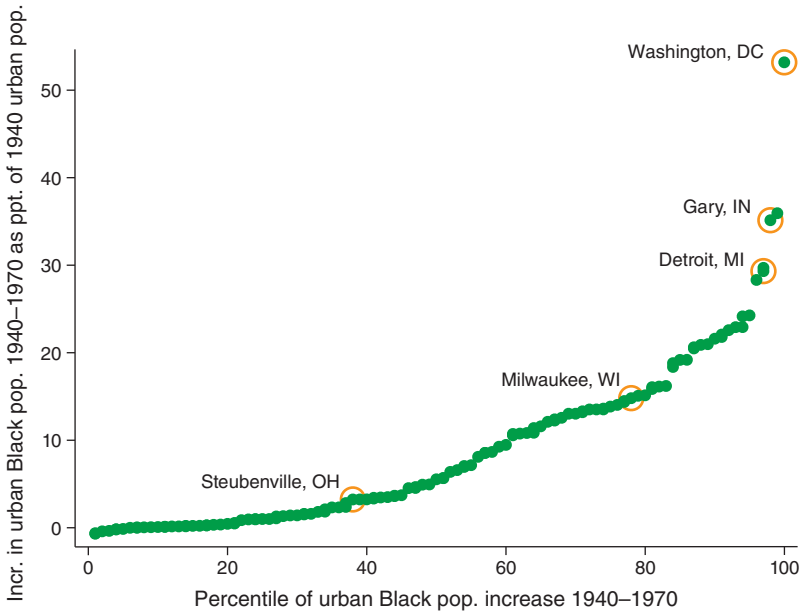


FIGURE 2. QUANTILES OF URBAN BLACK SHARE INCREASES, 1940–1970

Notes: This figure plots the quantile function of 1940–1970 increases in the urban Black population in CZs as a share of the total initial 1940 urban population, multiplied by 100 so that the units are percentage points. The CZs in sample are those containing the 296 non-southern mainland cities with information on the Black population in both 1940 and 1970 from the CCDB. Non-southern mainland excludes cities in the following states: Alabama, Alaska, Arkansas, Florida, Georgia, Hawaii, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia. Note, Washington, DC and cities in Delaware and Maryland were net receivers of Black migrants during the Great Migration and are included in the sample. The city of New Albany, IN is in the Louisville, KY CZ, which is included in the sample. Results are robust to excluding this CZ.

Source: CCDB

where $b^t_{\text{urban},CZ}$ is the total Black population in all sample cities in commuting zone CZ in year t.

Functional Form.—Because the distribution of Black population increases is highly right skewed, I define the quantile function GM_{CZ}, or the percentile of the increase, to be the key independent variable in the empirical analysis.[7] Figure 2 depicts GM_{CZ} across northern CZs during the Great Migration. Plotted on the y-axis is the measure in equation (1), multiplied by 100 so that the units are percentage points. The x-axis measures GM_{CZ}, the quantile function or the percentile of urban Black population increase.

The median increase across CZs in the sample was 5.6 percentage points. As the figure demonstrates, however, historical Black share increases were very unevenly distributed across the North, even among CZs in the same region. Take for example, two CZs in the Midwest—Pittsburgh, PA and Detroit, MI. Both were major manufacturing centers in the 1940s. Pittsburgh's urban Black population share increased

[7] This scaling is similar to that used by Sequeira, Nunn, and Qian (2020), who study the long-run effect of historical European immigration into the United States, which also exhibits a right-skewed distribution.

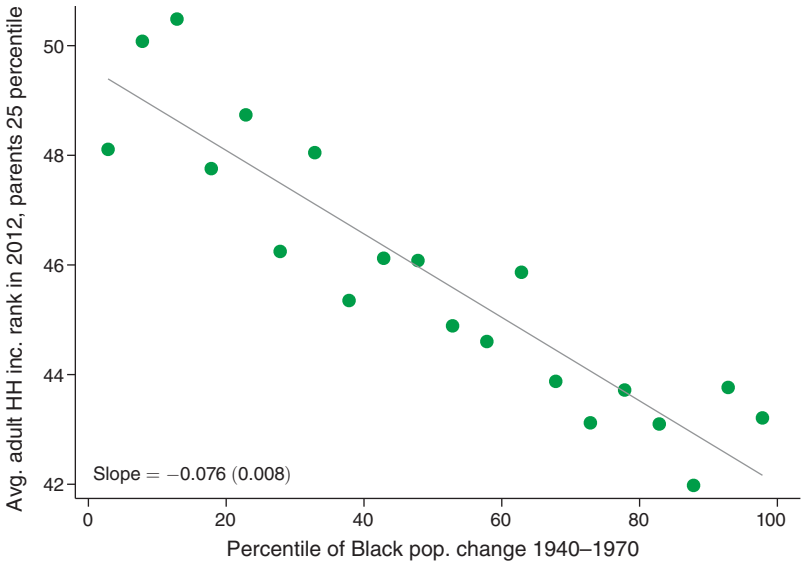


Figure 3. Relationship between 1940–1970 Black Population Change and Upward Mobility in the 2000s

Notes: This binned scatterplot depicts the relationship between average upward mobility in the 2000s for men and women with low income parents and the percentile of actual Black population increase during the Great Migration (1940–1970) for northern CZs. The unit of observation is a CZ. The right-hand-side variable is grouped into 20 bins (5 percentiles each). Upward mobility is defined as expected mean household income rank for men and women with parents at the twenty-fifth percentile of the parent income distribution. Income is measured from IRS tax returns for cohorts and parents of cohorts born between 1980 and 1986.

Sources: IPUMS complete count 1940 US census, CCDB

by 6.6 percentage points (corresponding to the fifty-third percentile) while Detroit's increased by 29.3 percentage points (corresponding to the ninety-seventh percentile). Salt Lake City, UT saw almost no increase in its Black population while Washington, DC saw an increase of roughly 53.2 percentage points.

The descriptive relationship between Black population change during the Great Migration and average income upward mobility today can be seen in Figure 3. The relationship is strikingly negative and linear.[8] A 1-percentile greater Black population increase between 1940 and 1970 is associated with a decline of −0.08 percentiles in adult income rank for individuals with lower income parents. However, as discussed below and in Section III, this relationship cannot be interpreted as causal given that correlates of Black population change may drive this relationship. Moving towards a causal framework requires understanding the historical forces behind migration during this period.

[8] The linearity of the relationship suggests that very large increases in the Black population share at the tail end of the distribution in Figure 2 had similar effects as smaller increases at the bottom and middle of the distribution. This may in part be due to the positive relationship between levels of the Black population share and changes in the Black population between 1940 and 1970. Small absolute increases which took place in locations with small Black population shares may still have prompted large responses. As I discuss in Section IV, my results are robust to flexibly controlling for the level of the Black population share in 1940.

Why did urban Black populations in the North increase so dramatically between 1940 and 1970? After a period of reduced mobility during the Great Depression, Black out-migration from the South resumed at an accelerated pace after 1940. Wartime jobs in the defense industry and in naval shipyards led to substantial Black migration to California and other Pacific states for the first time since the Migration began. Migration continued apace to midwestern cities in the 1950s and 1960s, as the booming automobile industry attracted millions more Black southerners to the North, particularly to cities like Detroit or Cleveland. Of the six million Black migrants who left the South during the Great Migration, four million of them migrated between 1940 and 1970 alone.

As is clear from the discussion above, mid-century economic conditions in northern cities influenced where migrants moved and are likely correlated with increases in the Black population during this period. They may also determine the dynamics of upward mobility in destinations. For example, Black urban populations increased more in places with higher levels of educational upward mobility (correlation: 0.27). If higher educational upward mobility reflects better school quality that may persist over time, then ordinary least squares (OLS) estimates of the Great Migration's impact on upward mobility will be biased towards zero.

At the same time, Black population increases are positively correlated with the share of the labor force in manufacturing in 1940 (correlation: 0.18). Former manufacturing centers form today's Rust Belt, an area of low upward mobility. Thus, deindustrialization could confound the effects of the Great Migration. Finally, migrant inflows were larger in locations that already had a large population of recent Black southern migrants (correlation: 0.56),[9] raising questions about the characteristics of destinations that led them to be hubs for Black southerners prior to 1940. Given that these destination-level factors may influence both Black population increases and future levels of upward mobility, I construct an instrument for the former that is plausibly exogenous with respect to pre-1940 destination characteristics.

III. Empirical Strategy

The intuition behind the empirical strategy is well captured by the migration histories of Detroit and Baltimore. Both were major destinations during the Great Migration as well as major industrial centers in 1940. However, Black migrants arriving in these locations in 1940 came from parts of the South that experienced very different patterns of out-migration between 1940 and 1970. Figure 4 depicts variation in Black migration for these two cities. Detroit drew the plurality of its migrants from Alabama while Baltimore drew the plurality from Virginia. Migrants from Alabama tended to come from counties specialized in cotton production, and negative shocks to cotton spurred out-migration from these areas. Virginia, by contrast, was a major recipient of war production spending during World War II. War

[9] Data on recent Black southern migrants come from the 1940 complete count census. The 1940 census was the first census to systematically record internal migration. Enumerators asked individuals about their prior residence (city, county, and state) in 1935. I define recent southern Black migrants as those who reported a southern county of residence in 1935 and lived in an northern city as of 1940. Here, southern is defined as being from the following states: Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia.

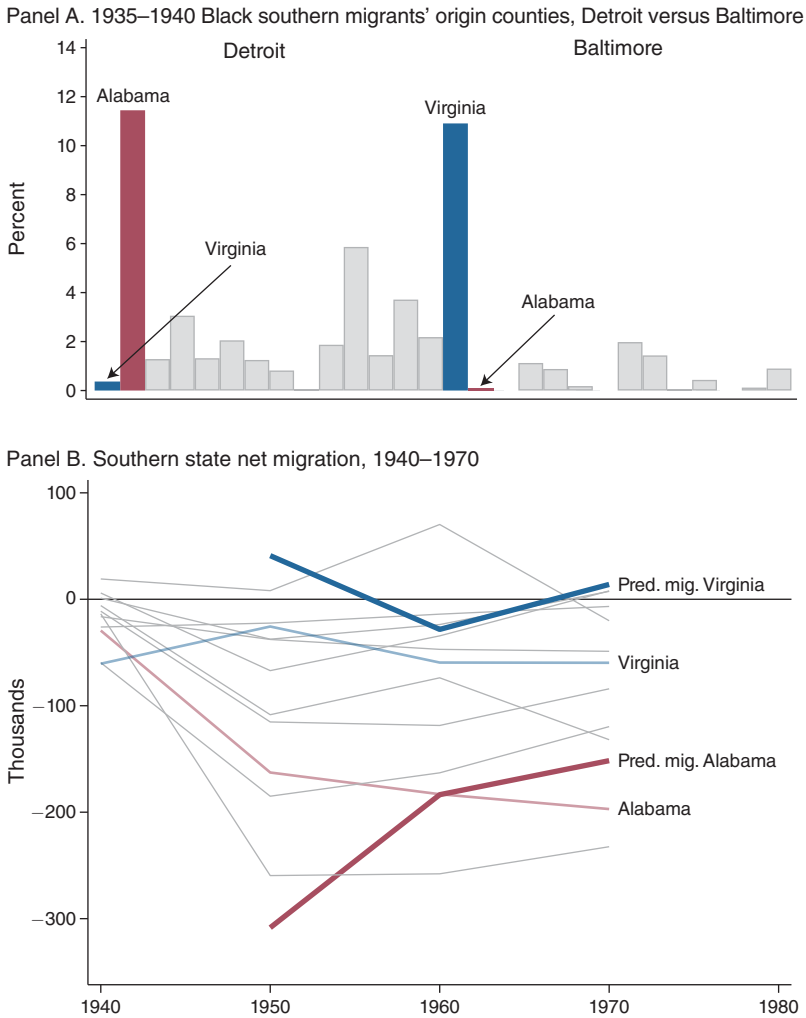


FIGURE 4. GREAT MIGRATION SHIFT-SHARE INSTRUMENT

Notes: This figure illustrates the variation underlying the shift-share instrument for urban Black population change in northern CZs. Panel A shows the share of recent Black southern migrants (those who migrated between 1935 and 1940) living in Detroit and Baltimore from the largest sending county in each southern state. For Alabama and Virginia, these are Jefferson County (Birmingham) and Richmond City County, respectively. Detroit received the plurality of its migrants from Alabama, and Baltimore from Virginia. Panel B shows net migration for southern states from 1940 to 1970, with net migration and predicted net migration for Alabama and Virginia highlighted. Negative numbers indicate out-migration. Darkened lines indicate net migration predicted using one-decade lagged southern county agricultural and World War II spending measures. Online Appendix C describes the construction of the instrument based on this variation. I use LASSO to select predictors each decade, interacting predicted migration with the share of recent Black southern migrants from each county, summing up over all southern counties. The procedure yields counterfactual increases in the urban Black population from 1940 to1970.

Sources: IPUMS complete count 1940 US census; Boustan (2016); Fouka, Mazumder, and Tabellini (forthcoming)

production jobs attracted Black workers and consequently lowered out-migration rates.

The empirical strategy generalizes from the example above and builds on the classic shift-share instrument used to estimate the local labor market impacts of migration (Altonji and Card 1991). The technique was first adapted to the Great

Migration context by Boustan (2010). Black southern migrants tended to move where previous migrants from their communities had settled, thus generating correlated origin-destination flows similar to those observed in the international migration context. Shocks to migrants' origin locations ("push factors") are plausibly orthogonal to shocks to the destinations ("pull factors") that could also influence the location choices of future migrants. Interacting exogenous shifts in migration at the origin level with historical migration patterns in the destinations yields a potential instrument for Black population changes in the North.

To construct my instrument for Black population change in northern cities, I interact variation in the cities' pre-1940 migrant composition with variation in out-migration from southern counties driven by push factors alone. These push factors include defense facility spending in southern counties during World War II and shocks to cotton and other economic sectors in the South, e.g., tobacco and mining. More precisely, I replace the numerator in equation (1) with the predicted, as opposed to actual, increase in the Black population:

$$\text{Predicted Black pop}_{CZ}^{1940\text{–}1970} = \frac{\widehat{\Delta b}_{\text{urban},CZ}^{1940\text{–}1970}}{\text{pop}_{\text{urban},CZ}^{1940}}, \tag{2}$$

where $\widehat{\Delta b}_{\text{urban},CZ}^{1940-1970}$ denotes the predicted increase, which I define as follows:

$$\widehat{\Delta b}_{\text{urban},CZ}^{1940\text{–}1970} = \sum_{j \in S} \sum_{c \in CZ} \omega_{jc}^{1935\text{–}1940} \times \hat{m}_j^{1940\text{–}1970}. \tag{3}$$

The term $\hat{m}_j$ is predicted Black migration from southern county j over the decades 1940–1970, and ω_{jc} is the share of recently migrated pre-1940 Black southern migrants from county j living in city c in 1940. The term $\hat{m}_j^{1940\text{–}1970}$ consists of the sum of fitted values of decadal predictions of southern county net migration (from 1940 to 1950, 1950 to 1960, and 1960 to 1970) using lagged southern economic predictors of migration:

$$\hat{m}_j^{1940\text{–}1970} = \sum_{t=1950}^{1970} \widehat{\text{mig rate}}_{jt} \times \text{Black pop}_{jt},$$

where fitted values, $\widehat{\text{mig rate}}_{jt} = \text{mig rate}_{jt} - \varepsilon_{jt}$, come from the following prediction of net migration rates:

$$\text{mig rate}_{jt} = \beta_0 + Z'_{jt-10}\beta_1 + \varepsilon_{jt}.$$

Online Appendix C describes the construction of ω_{jc} and $\hat{m}_j^{1940\text{–}1970}$ and the procedure for choosing predictors Z'_{jt-10} in detail. After computing predicted increases in the urban Black population in northern CZs using this method, I use the percentile of predicted increases, $\widehat{GM}_{CZ}$, to instrument for the percentile of observed increases in the Black population, GM_{CZ}.

My empirical strategy builds off of the identification strategy developed by Boustan (2010) and used in subsequent papers on the Great Migration (Tabellini 2018; Fouka, Mazumder, and Tabellini forthcoming), but introduces two key

innovations. As I show below, these innovations enhance the credibility of my estimates, by allowing for multiple alternative instruments, and increase precision by leveraging rich, county-level variation in migration patterns.

First, I use the complete count 1940 census, which contains microdata on the universe of recent Black southern migrants into northern cities, including their county of residence in 1935. Using county of residence in 1935 and city of residence in 1940, I construct a matrix of southern-county-to-northern-city linkages containing the share of each southern county's out-migrants who settled in each northern city. This detailed linkage contrasts with the state-level linkage used in the prior literature.[10] Using the complete count census data, I am able to leverage shocks to over 1,200 origin counties as opposed to just 14 southern states. A large number of shocks is important for the validity of the empirical strategy when identification relies on shocks to origin locations being orthogonal to shocks to the destinations (Goldsmith-Pinkham, Sorkin, and Swift 2020; Adão, Kolesár, and Morales 2019; Borusyak, Hull, and Jaravel forthcoming).

The second innovation is that I use machine learning to improve the prediction of net migration from southern counties. The motivation for this approach is that the set of potential predictors from southern county variables is large. Given that the first stage prediction of an endogenous variable by an instrument can be viewed as a pure prediction problem (Belloni, Chernozhukov, and Hansen 2011), I select among the predictors for migration used by Boustan (2010) using a post-LASSO estimation procedure. In this procedure, for each decade of migration between 1940 and 1970, I use LASSO to select predictors among county characteristics in the previous decade with a penalty on the absolute number of predictors, where the tuning parameter has been chosen by five-fold cross-validation. I then use the variables chosen by this procedure to estimate their relationship with county net migration rates using OLS.

To focus on variation from specific southern-county shocks, I control for the total share of the 1940 urban population made up of recent Black migrants from any southern county. I also include the following baseline 1940 characteristics for robustness: educational upward mobility and the share of the labor force in manufacturing. These regressions can be interpreted as estimating the effect of historical Black population change on the change in upward mobility in destinations, where I allow for dynamics in upward mobility.[11] Finally, I include census region fixed effects. The inclusion of these controls does not significantly alter the point estimates, and I report key results with and without this baseline set of controls in Tables 8 and 9.[12]

[10] Exceptions include Black et al. (2015), Stuart and Taylor (2021a), and Stuart and Taylor (2021b), who use the Duke SSA/Medicare dataset, no longer available to new researchers. Boustan (2010) uses census tabulations with migrants' 1935 state of residence to construct southern-state-to-northern-city migration shares. The 1940 census was declassified in 2012, so the empirical strategy used in the present study was not feasible then.

[11] If upward mobility changed in the treated CZs for reasons other than the Great Migration, forcing the coefficient on historical upward mobility to be one may be a misspecification of the true relationship between the Migration and upward mobility. Results are robust to an alternative specification where I estimate the Great Migration's impact on the 1940–2015 change in upward mobility for Black men (see Section IVC).

[12] Including the controls leads to more precise and larger instrumental variable estimates of the impact of the Great Migration on upward mobility. However, the point estimate without controls is not statistically different from the point estimate with census region fixed effects or with the full set of baseline controls. See columns 1, 2, and 3 of Table 8. A potential reason for the difference in the point estimates between columns 1 and 2 is that the instrument for Black population increases leverages linkages between southern origin locations and northern destinations made

Estimating Equation.—I estimate the relationship between the Great Migration and upward mobility using the following empirical framework:

$$\bar{y}_{p,CZ} = \alpha + \beta GM_{CZ} + \mathbb{X}'_{CZ}\Gamma + \varepsilon_{CZ} \tag{4}$$

$$\text{First Stage:} \quad GM_{CZ} = \gamma + \delta \widehat{GM}_{CZ} + \mathbb{X}'_{CZ}\mu + \epsilon_{CZ}. \tag{5}$$

In equation (4), the coefficient β represents the OLS estimate of the effect of GM_{CZ}, the percentile of a CZ's 1940–1970 Black population increase, on $\bar{y}_{p,CZ}$, the average adult income rank of children with parents at income rank p, conditional on baseline characteristics and census region fixed effects represented by the control vector $\mathbb{X}_{CZ}$. Equation (5) estimates the first stage relationship between the instrument, the percentile of predicted Black population change $\widehat{GM}_{CZ}$, and the percentile of actual Black population change GM_{CZ}. The reduced form equation is as follows:

$$\bar{y}_{p,CZ} = \tilde{\alpha} + \tilde{\beta}\widehat{GM}_{CZ} + \mathbb{X}'_{CZ}\tilde{\Gamma} + \tilde{\varepsilon}_{CZ}, \tag{6}$$

where $\tilde{\beta}$ represents the reduced form impact of the Great Migration instrument on upward mobility. For all main results, I report the estimated OLS (β), reduced form ($\tilde{\beta}$), and two-stage least squares or 2SLS ($\tilde{\beta}/\delta$) coefficients.

Identifying Assumption and Validity Checks.—In order for the approach above to identify the causal impact of the Great Migration, conditional on the specified baseline 1940 characteristics, my instrument for Black population increases must be orthogonal to omitted characteristics that are correlated with changes in upward mobility after 1940. This identifying assumption can be stated formally as

$$\mathbb{E}\left[\widehat{GM}_{CZ} \times \tilde{\varepsilon}_{CZ} | \mathbb{X}_{CZ}\right] = 0. \tag{7}$$

Although this assumption cannot be directly tested, relying on shocks to southern counties assuages concerns that my instrument for Black in-migration is correlated with unobserved determinants of upward mobility in the North. Still, I provide further corroborating evidence of this assumption in two ways: testing for pretrends and evaluating whether correlated shocks to northern cities and southern counties plausibly explain my results.

Conditional on baseline controls, the instrument for the Great Migration based on shocks to southern counties is uncorrelated with educational upward mobility prior to 1940. Table 1 reports the coefficients on $\widehat{GM}$ from the reduced form model in Equation (6). The coefficients are very small in magnitude relative to dependent variable means, statistically insignificant, and similar across the decades 1900 to

between 1935 and 1940. Relatively few Black southern migrants had settled in the West by 1940; thus, relative to the endogenous variable, the instrument reallocates migrants towards the Midwest as opposed to the West. It would be ideal to use the 1950 census to establish the migrant network for the West as many African Americans moved west for the first time during World War II. The required microdata from the 1950 census will be available in 2022. Given these data constraints, inclusion of census region fixed effects reduces the noise introduced by pre-1940 migrant networks.

Table 1—Placebo Test of Identification Strategy Using Pre-1940 Upward Mobility and Educational Attainment

	Percentage of teens with low occupation score fathers attending school					Median adult education
$\widehat{GM}$	1900	1910	1920	1930	1940	1940
	0.011	0.025	0.011	0.023	0.014	−0.013
	(0.033)	(0.027)	(0.024)	(0.029)	(0.016)	(0.009)
Baseline mean	55.514	75.662	65.477	74.912	80.668	27.355
St. dev. dep. var.	9.712	8.026	7.425	8.674	5.773	2.863
St. dev. GM	28.976	28.976	28.976	28.976	28.976	28.976
Observations	130	130	130	130	130	130
Baseline controls	Y	Y	Y	Y	Y	Y

Notes: This table reports the effect of the Great Migration on pre-1940 educational upward mobility and attainment. The unit of observation is a CZ. In columns 1 through 5, the dependent variable is the school attendance rate (in percentage points) of 14-to-17-year-old boys and girls with below-median occupation score fathers from 1900 to 1940, respectively. In column 6, the dependent variable is the median education attainment score of adults aged 25 and older in 1940, where the sample mean of 27.4 corresponds to 9 years of education. The independent variable is the instrument for Black population increase from 1940 to 1970: the percentile of predicted Black population increase, defined as the interaction between pre-1940 Black southern migration patterns and post-1940 outflows of migrants as predicted by southern economic factors alone. Baseline 1940 controls include the share of the urban population made up of 1935–1940 Black southern migrants, educational upward mobility, the share of the labor force in manufacturing, and census region fixed effects. Standard errors are in parentheses.

Sources: IPUMS complete count 1900–1940 US censuses, Boustan (2016)

1940. The Migration also does not predict any differences in median adult educational attainment in 1940.[13]

A new literature on shift-share instruments highlights two paths to identification: quasi-randomness of shares versus quasi-randomness of shifters. In the context of the Great Migration, early southern migrants were not choosing northern locations at random, as I show in Section IIB. Rather, it is shocks to migrants' home counties that generates exogenous shifters of the Black population in the North. A key assumption of this latter approach is that shocks to the South are not correlated with shocks to the North (Borusyak, Hull, and Jaravel forthcoming).

To support the assumption that the results are not simply generated by correlated shocks to origins and destinations, I construct alternative instruments and conduct an overidentification test. In addition to the baseline instrument, I construct a second instrument using southern county out-migration rates that are first residualized on state fixed effects. This version of the instrument accounts for correlated shocks to southern states and northern destinations (e.g., Virginia and Baltimore, which both have a substantial defense industry). Note that shocks must be negatively correlated to generate both out-migration from the origin location and endogenous in-migration to the northern destination. A third instrument uses variation in state of birth across the southern-born Black population in northern cities in 1940 interacted with state-level net migration. This instrument leverages northern cities' exposure to

[13] Online Appendix Table D4 shows the instrument also does not predict other baseline socioeconomic characteristics of destination CZs, including average marriage rates, occupational status, or income.

a different set of origin shocks: shocks to the birth states of southern-born northern Black residents as opposed to southern counties of prior residence for recent Black migrants identified through the 1940 census migration look-back question.[14] Online Appendix Figure D16 shows that the results using each of these instruments are extremely similar, and a formal overidentification test fails to reject the null that the estimated effects on upward mobility are statistically indistinguishable from each other (Hansen J statistic p-value of 0.20).

Adão, Kolesár, and Morales (2019) note that in the case of shift-share instruments, standard inference procedures, such as geographic clustering, may result in standard errors that are too small. This will be the case, for example, if a set of southern counties bears similar importance across multiple northern cities, generating correlation at the origin county level across destinations. Following Adão, Kolesár, and Morales (2019), I run a placebo analysis interacting recent Black southern migrant location choices with random shocks. The resulting coefficients are significantly negative at the 1 percent level just 6.1 percent of the time, suggesting that the impact of the Great Migration on upward mobility is unlikely to be driven by noise. More details are provided in the online Appendix D, Section 7.7.

First-Stage Results.—Figure 5 shows a binned scatterplot of the relationship between GM, the percentile of actual Black population increase, and $\widehat{GM}$, the percentile of predicted Black population increase, where both measures have been residualized on census region fixed effects and the set of 1940 baseline controls: educational upward mobility, the share of the labor force in manufacturing, and the share of the 1940 urban population made up of recent southern Black migrants from any southern county. The y-axis plots mean percentile of Black population change within 20 5-percentile bins of predicted Black population change. The slope of the regression line is equivalent to the coefficient $\hat{\delta}$ from equation (5). A 1-percentile larger predicted Black population increase is associated with a 0.30-percentile greater actual Black population increase over the time period. The F-statistic on the first stage is 15.3.

IV. Results on Upward Mobility

The Great Migration represented a large-scale movement to opportunity for Black Americans. In the North, jobs were far better paying, Black children could attend public high school, and racial equality was taken for granted in many facets of northern life.[15] From the vantage point of 1940, there was every reason to believe future generations of Black children would continue to reap the benefits of their parents and grandparents having migrated. The results from the empirical analysis in this paper suggest otherwise. While the focus of my study is how the Migration altered opportunities within the North, depending on the degree of in-migration, the

[14] The fact that this instrument yields similar results as the baseline provides reassurance that results are not driven by the specific shares constructed using recent Black southern migrants' origin locations as opposed to those of longer-term Black residents of the North.

[15] See Wilkerson (2011) for accounts and experiences of individual migrants arriving in and navigating new lives in the North.

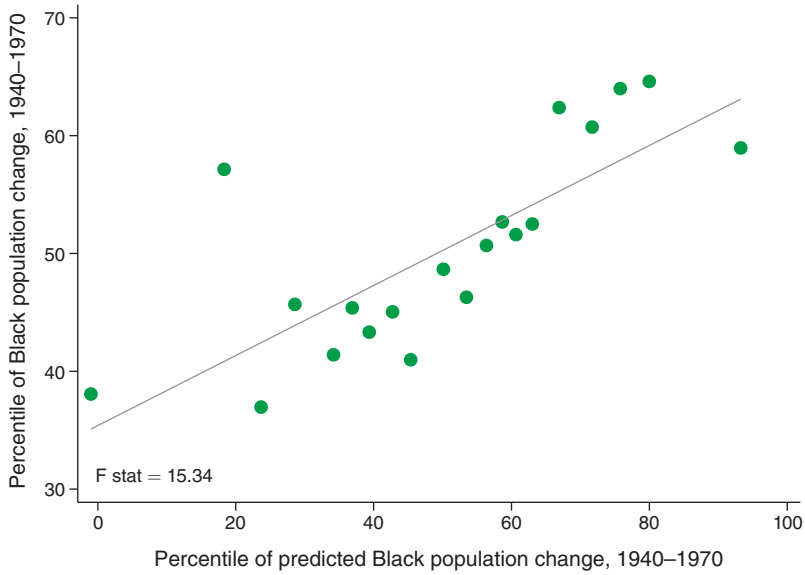


Figure 5. First Stage on Black Population Change

Notes: This binned scatterplot depicts the relationship between the percentile of actual Black population increase during the Great Migration (1940–1970) for northern CZs and the instrument for Black population increase over the same period. The instrument is the percentile of predicted Black population increase, defined as the interaction between pre-1940 Black southern migration patterns and post-1940 outflows of migrants as predicted by southern economic factors alone. The right hand side variable is grouped into 20 bins (5 percentiles each). Both the left-hand- and right-hand-side variables have been residualized on the set of baseline 1940 controls, including share of urban population made up of 1935–1940 Black southern migrants, educational upward mobility, share of labor force in manufacturing, and census region fixed effects.

Sources: IPUMS complete count 1940 US census, Boustan (2016)

effects were so large as to bring average outcomes in the North in line with those of an improving South.

A. *Impact on Raw versus Causal Upward Mobility Estimates*

A key contribution of this paper is to provide causal evidence of the Great Migration's effect on the gains from growing up in specific locations, thus illustrating the endogeneity of location effects with respect to changes in local racial composition. Doing so requires separating out the Migration's effects on the composition of local families, which may alter average outcomes, from effects on the environment or locational factors. I illustrate this below in a simple framework.

Let the outcome for a child i with parent household income rank p living in commuting zone CZ be the sum of a pure location component, $\mu_{p,CZ}$, and an idiosyncratic family component, $\theta_{ip,CZ}$:

$$y_{ip,CZ} = \mu_{p,CZ} + \theta_{ip,CZ}. \tag{8}$$

Recall, I observe mean outcomes in a location at a given parent rank p:

$$\bar{y}_{p,CZ} = \mu_{p,CZ} + \bar{\theta}_{p,CZ}. \tag{9}$$

The Migration's effect on average upward mobility, or $d\bar{y}_{p,CZ}/dGM_{CZ}$, can be decomposed into its constituent effects on the composition of families living in a destination, $d\bar{\theta}_{p,CZ}/dGM_{CZ}$, versus the effect of the Migration on the gains from growing up in specific CZs, $d\mu_{p,CZ}/dGM_{CZ}$, the key parameter in this study:

$$\frac{d\bar{y}_{p,CZ}}{dGM_{CZ}} = \frac{d\mu_{p,CZ}}{dGM_{CZ}} + \frac{d\bar{\theta}_{p,CZ}}{dGM_{CZ}}. \tag{10}$$

One example of $\bar{\theta}$ includes the racial composition of families, which if not taken into account, could explain a substantial portion of the Migration's estimated impact on $\bar{y}_{p,CZ}$. Several studies have found persistent differences in intergenerational mobility by race, even among those growing up in the same census tract (Mazumder 2014, Davis and Mazumder 2018, Chetty et al. 2020). Because the Migration increased the fraction Black in destination locations, average upward mobility may be mechanically lowered through this channel. In Section IVB, I show how the estimates in this section indeed reflect in part this composition effect. Using race-specific mobility outcomes purges the data of this composition effect; however, it does not address other sources of unobserved heterogeneity across families, such as a differential propensity to invest in children's education.

Examples of μ, by contrast, include any and all location factors that influence children's long-run outcomes outside of one's own family, such as schools or other local public goods, neighborhood quality and crime rates, or peer effects.[16] By altering incumbent residents' location choices, giving rise to segregation, or by changing the equilibrium bundle of public goods voted on by local residents (Alesina, Baqir, and Hoxby 2004), the Migration may affect children's outcomes independent of their families' characteristics.

My analysis focuses on two measures of upward mobility to distinguish these channels and to probe the robustness of my findings—the raw, average outcomes of children with low or high income parents by location and the causal effect of location on children's outcomes, encompassing the myriad factors listed above.

Figure 6 shows a binned scatterplot of the relationship between $\widehat{GM}$ and average outcomes for individuals with low income parents (at the twenty-fifth percentile of the parent income distribution). The outcome variable is the estimated mean household income rank of individuals with parents at income rank p by childhood CZ. Both the outcome and $\widehat{GM}$ have been residualized on the baseline set of controls discussed in Section III. Each dot represents average outcomes across CZs within 5-percentile bins of the shock. As in the raw data reported in Figure 3, Figure 6 shows a striking negative relationship between historical Black migrant inflows

[16] Note that I have modeled the effect of family and location factors additively. I do not include an interaction term reflecting potentially different causal effects of location by family type or characteristics as differentiated estimates such as these are not available.

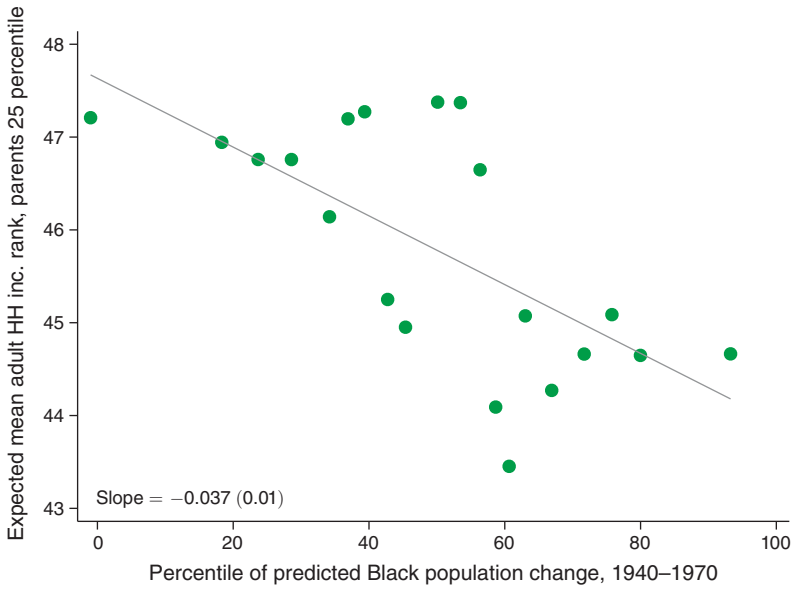


Figure 6. Great Migration Reduced Average Upward Mobility in Northern CZs

Notes: This binned scatterplot depicts the relationship between average upward mobility in the 2000s for men and women with low-income parents and the instrument for Black population increases during the Great Migration. The unit of observation is a CZ. The right-hand-side variable is grouped into 20 bins (5 percentiles each). Upward mobility is defined as expected mean household income rank for men and women with parents at the twenty-fifth percentile of the parent income distribution. Income is measured from IRS tax returns for cohorts and parents of cohorts born between 1980 and 1986. The instrument is the percentile of predicted Black population increase, defined as the interaction between pre-1940 Black southern migration patterns and post-1940 outflows of migrants as predicted by southern economic factors alone. Both the left-hand- and right-hand-side variables have been residualized on the set of baseline 1940 controls, including share of urban population made up of 1935–1940 Black southern migrants, educational upward mobility, share of labor force in manufacturing, and census region fixed effects.

Sources: IPUMS complete count 1940 US census, Boustan (2016), Chetty and Hendren (2018b)

and average outcomes for individuals from low income families in destination CZs today.

Table 2 reports 2SLS estimates of the relationship. A 1-percentile increase in the historical Black population lowered household income rank by 0.125 percentile points (standard error $=$ 0.033). OLS estimates are reported in Table 2 as well.[17] Scaling this effect by a one standard deviation increase in the Black population share, the estimated coefficient represents an 11.3 percent drop in adult income. The results show that historical Black migrant inflows reduced average upward mobility for low income families in the destination CZs today, which may stem from composition effects or locational factors.

I then estimate the Great Migration's impact on the causal effect of childhood locations, a proxy for $\mu_{p,CZ}$ in equation (8), which I take from Chetty and Hendren

[17] Online Appendix Table D5 reports the results for individuals with high-income parents. I find more modest effects of $\widehat{GM}$ on the outcomes of individuals with high-income parents (at the seventy-fifth percentile of the parent income distribution). For this group, a 1-percentile increase in the historical Black population lowered household income rank by 0.054 percentile points (standard error $=$ 0.023). See online Appendix D, Section 2 for more details.

Table 2—Lower Average Upward Mobility in 2000s for Low-Income Families in Great Migration CZs

	Household income rank			Individual income rank		
	Pooled	Women	Men	Pooled	Women	Men
Panel A. First stage on GM						
$\widehat{GM}$	0.297	0.297	0.297	0.297	0.297	0.297
	(0.0759)	(0.0759)	(0.0759)	(0.0759)	(0.0759)	(0.0759)
F-stat	15.34	15.34	15.34	15.34	15.34	15.34
Panel B. OLS						
GM	−0.0655	−0.0570	−0.0742	−0.0331	−0.00375	−0.0618
	(0.00995)	(0.0101)	(0.0104)	(0.0108)	(0.0137)	(0.0108)
R^2	0.571	0.528	0.593	0.345	0.254	0.492
Panel C. Reduced form						
$\widehat{GM}$	−0.0370	−0.0308	−0.0432	−0.0282	−0.0128	−0.0439
	(0.00974)	(0.00973)	(0.0103)	(0.00965)	(0.0121)	(0.0101)
R^2	0.481	0.451	0.495	0.341	0.260	0.443
Panel D. 2SLS						
GM	−0.125	−0.104	−0.145	−0.0950	−0.0432	−0.148
	(0.0328)	(0.0318)	(0.0354)	(0.0353)	(0.0410)	(0.0386)
Observations	130	130	130	130	130	130
Mean rank	45.79	47.04	44.55	45.54	42.74	48.29
St. dev. rank	3.379	3.283	3.617	2.972	3.527	3.375
St. dev. GM	28.98	28.98	28.98	28.98	28.98	28.98

Notes: This table reports the estimated impact of the Great Migration on average upward mobility in the 2000s for men and women with low-income parents. The unit of observation is a CZ. The dependent variable is expected mean individual or household income rank for individuals with parents at the twenty-fifth percentile of the parent income distribution. Income is measured from IRS tax returns for cohorts and parents of cohorts born between 1980 and 1986. Pooled income refers to household income, pooling across men and women. The independent variable is the percentile of Black population increase during the Great Migration. The instrument for Black population increase is the percentile of predicted Black population increase, defined as the interaction between pre-1940 Black southern migration patterns and post-1940 outflows of migrants as predicted by southern economic factors alone. Baseline 1940 controls include the share of the urban population made up of 1935–1940 Black southern migrants, educational upward mobility, the share of the labor force in manufacturing, and census region fixed effects. Standard errors are in parentheses.

Sources: CCDB, IPUMS complete count 1940 US census, Boustan (2016), Chetty and Hendren (2018b)

(2018b). The authors estimate CZ effects on children's adult income using families that moved across CZs and exploiting variation in children's ages at the time their families moved. Details on the construction and validity of these measures are available in online Appendix D, Section 4. The impact of the Great Migration on this alternative measure of upward mobility can be interpreted as follows: a child randomly assigned to spend an additional year in a CZ that experienced a large Great Migration shock versus one that experienced a smaller shock has greater or lower adult income rank.[18]

[18] One downside of these measures is that they are not available separately for Black and White children, preventing me from exploring potentially heterogeneous impacts of the Migration on $\mu_{pr,CZ}$, or location effects by racial group r. This means I identify impacts of the Migration on childhood exposure up to an average effect

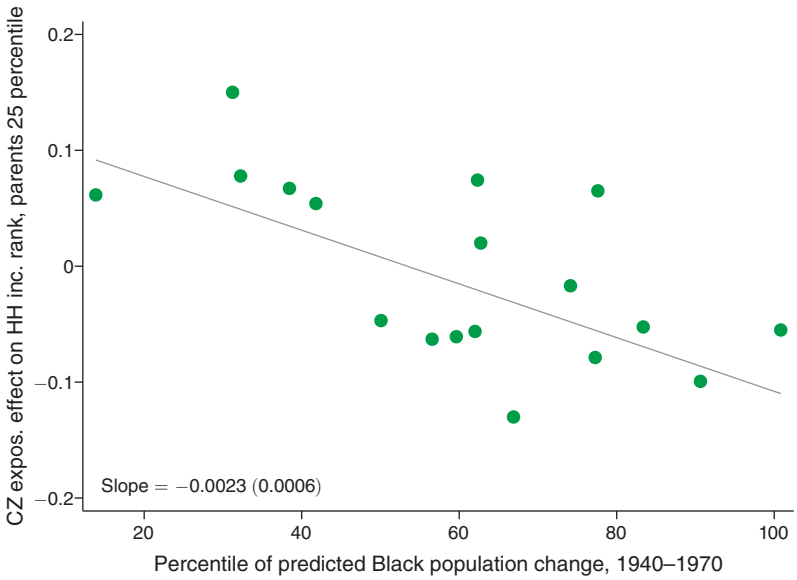


Figure 7. Childhood in Great Migration CZs Lowers Adult Income of Children from Low Income Families

Notes: This binned scatterplot depicts the relationship between childhood exposure effects in the 2000s for men and women with low-income parents and the instrument for Black population increases during the Great Migration. The unit of observation is a CZ. The right-hand-side variable is grouped into 20 bins (5 percentiles each). Childhood exposure effects are the estimated causal impact of one additional year of childhood in the CZ on adult household income rank for men and women with parents at the twenty-fifth percentile of the parent income distribution. Income is measured from IRS tax returns for cohorts and parents of cohorts born between 1980 and 1986. The instrument is the percentile of predicted Black population increase, defined as the interaction between pre-1940 Black southern migration patterns and post-1940 outflows of migrants as predicted by southern economic factors alone. Both the left-hand- and right-hand-side variables have been residualized on the set of baseline 1940 controls, including share of urban population made up of 1935–1940 Black southern migrants, educational upward mobility, share of labor force in manufacturing, and census region fixed effects.

Sources: IPUMS complete count 1940 US census, Boustan (2016), Chetty and Hendren (2018b)

Figure 7 shows a binned scatterplot of the impact of the Great Migration on CZ childhood exposure effects for individuals with parents from the twenty-fifth percentile of the parent income distribution. Both the outcome and $\widehat{GM}$ have been residualized on the baseline set of controls discussed in Section III. Each dot represents average outcomes across CZs within 5-percentile bins of the shock. The figure shows a strong negative relationship between historical Black migrant inflows and the effects of childhood exposure to destination CZs. Just one year in a CZ with a larger Great Migration influx lowers adult income relative to a year in a less affected CZ.

Table 3 reports OLS and 2SLS estimates of the relationship. The 2SLS estimates can be interpreted as follows: a 1-percentile larger increase in the historical Black population lowers household income rank by 0.0087 percentile points (standard

across racial groups. In Section IVB, I directly estimate the effect of the Migration on upward mobility for Black and White families separately and discuss how the population-weighted average of these effects compares to the estimates for all racial groups discussed in this section.

Table 3—Childhood Exposure to Great Migration CZs Lowers Upward Mobility for Low-Income Families

Panel A. First stage on GM						
$\widehat{GM}$	0.266	0.263	0.269	0.264	0.263	0.269
	(0.0640)	(0.0639)	(0.0645)	(0.0641)	(0.0642)	(0.0645)
F-stat	17.27	16.91	17.38	16.99	16.72	17.35
	Household income rank			Individual income rank		
	Pooled	Women	Men	Pooled	Women	Men
Panel B. OLS						
GM	−0.00256	−0.00169	−0.00438	−0.00210	0.000437	−0.00433
	(0.000848)	(0.00125)	(0.00126)	(0.000865)	(0.00125)	(0.00134)
R^2	0.224	0.115	0.233	0.190	0.0345	0.208
Panel C. Reduced form						
$\widehat{GM}$	−0.00232	−0.00209	−0.00318	−0.00189	−0.00111	−0.00276
	(0.000631)	(0.000930)	(0.000967)	(0.000647)	(0.000939)	(0.00103)
R^2	0.249	0.138	0.226	0.206	0.0445	0.188
Panel D. 2SLS						
GM	−0.00871	−0.00794	−0.0118	−0.00716	−0.00424	−0.0103
	(0.00279)	(0.00381)	(0.00393)	(0.00271)	(0.00368)	(0.00397)
Observations	130	130	130	130	130	130
Precision wt	Y	Y	Y	Y	Y	Y
Mean expos. FX	−0.0160	−0.0151	−0.0303	0.0223	0.0236	−0.0000692
St. dev. expos. FX	0.172	0.235	0.259	0.172	0.226	0.271
St. dev. GM	24.82	24.42	24.84	24.99	24.76	24.95

Notes: This table reports the estimated impact of the Great Migration on childhood exposure effects (expos. FX). The unit of observation is a CZ. The dependent variable is the estimated causal impact of an additional year of childhood in the CZ on adult income rank for those with parents at the twenty-fifth percentile of the parent income distribution. Income is measured from IRS tax returns for the 1980–1986 birth cohorts. The independent variable is the percentile of Black population increase during the Great Migration. The instrument is the percentile of predicted Black population increase, defined as the interaction between pre-1940 Black southern migration patterns and post-1940 outflows of migrants as predicted by southern economic factors alone. Baseline 1940 controls include the share of the urban population made up of 1935–1940 Black southern migrants, educational upward mobility, the share of the labor force in manufacturing, and census region fixed effects. Standard errors are in parentheses.

Sources: CCDB, IPUMS complete count 1940 US census, Boustan (2016), Chetty and Hendren (2018b)

error = 0.0028) per year of childhood exposure.[19] The 2SLS coefficients are larger in magnitude than the OLS although they are not statistically indistinguishable from each other at the 5 percent level. Nevertheless, the differences in the magnitudes may once again indicate that omitted characteristics are positively correlated with both childhood exposure effects and Black population change, biasing the OLS estimates towards zero.

Interpretation of Results on Childhood Exposure Effects.—The results thus far support the hypothesis that one way that responses to the Great Migration lowered upward mobility was through a changing environment for families. These

[19] For individuals from high-income families, I find effects of about half the size—consistent with the results on average upward mobility. See online Appendix Table D6 for these results and online Appendix D, Section 2 for more details.

estimated impacts on childhood environment can be combined with the first set of results on average upward mobility to quantify the impact of the Migration through location ($\mu_{p,CZ}$) versus selection ($\bar{\theta}_{p,CZ}$).

I do this by scaling the effect on one year of childhood to represent full childhood exposure to a Great Migration destination and comparing this to the effect on average outcomes. I make two increasingly conservative assumptions to arrive at an appropriate scaling factor. First, I follow Chetty and Hendren (2018a) and Chetty and Hendren (2018b), who assume constant location effects over each year of childhood and multiply exposure effects by 20 to approximate full childhood exposure.[20] Next, I apply a smaller scaling factor of 15.53 based on evidence from Chetty et al. (2020) and Deutscher (2020), who demonstrate a kink in exposure effects around age 13, with preteen years of exposure having a smaller effect than postteen years (see online Appendix Figure D5).[21]

Table 4 reports these results. All estimates have been scaled to represent the effects of a one standard deviation increase in Great Migration inflows.[22] Column 1 reports the effect of the Great Migration on adult income rank solely through childhood exposure to the location. Column 2 reports the same effect on average upward mobility. The latter estimate combines the Migration's effects through selection and location. The ratio of column 1 estimates to column 2 estimates gives a sense of what share of the impact of the Migration is driven by location versus selection effects.

Using the least conservative assumption, 120 percent ($(-4.3/-3.6) \times 100$ percent) of the impact of the Migration on upward mobility can be attributed to location channels, consistent with positive selection bias on net. The second row takes into account more muted impacts of early years of childhood exposure. In this case, I find that the location channels explain 93 percent of the Migration's effect on upward mobility.

Table 4—Contribution of Location versus Selection in Great Migration Effects

	CZ childhood exposure effects	Average upward mobility
20 years	−4.3	−3.6
15.53 years	−3.4	−3.6

Notes: All 2SLS specifications include region fixed effects as well as baseline controls from 1940, including total 1935–1940 Black southern migrant share of the population, share of the labor force in manufacturing, and educational upward mobility.

[20] Using 20 years as a scaling factor makes my results comparable to, for example, the decomposition from Chetty and Hendren (2018b) that 80 percent of the correlation between upward mobility and segregation is due to location effects while 20 percent is due to sorting.

[21] In online Appendix D, Section 4, I discuss a third, arguably overly conservative scaling factor that takes into account limitations in the data used to estimate causal location effects. Family location is only observed starting at age 16 for the oldest cohorts of children in the tax records data. Using information on the share of 16-year-olds in the data who lived in the same location at age 8 and making the extreme assumption that of those, none were in that location before age 8, and of the others, none were exposed until age 16, I apply a smaller scaling factor of 14.52. Even under this assumption, 87 percent of the Great Migration's impact is via location, not family composition effects. Online Appendix D, Section 4 provides additional details, including the exact numbers and calculations used to derive these alternative scaling factors.

[22] For column 1 results where precision weights are used, a one standard deviation increase in Migration inflows is a 25-percentile increase in the historical Black population. For column 2, a one standard deviation increase in the Migration is a 29-percentile increase. See the bottom row of Tables 2 and 3.

Given the degree of uncertainty in these estimates, I cannot entirely rule out negative selection; however, the results strongly indicate that changes in childhood environment are the primary mechanism for the Migration's impact on upward mobility. In what follows, I provide additional evidence for this hypothesis through two entirely separate analyses. First, in the next section, I show that among Black children, those growing up in places with larger historical Great Migration inflows have lower income as adults than Black children from similarly resourced families growing up in less affected locations. Thus, the results are not simply driven by increasing the share of Black families, who have lower upward mobility regardless of location, in destination CZs. Second, in Section V, I document clear changes in public spending, segregation, and neighborhood quality in Great Migration CZs that accord with destinations altering substantially in response to the Migration.

B. *Heterogeneity by Race and Gender*

To assess whether different groups of children were more or less affected by the Migration, I estimate the long-run impact of $\widehat{GM}$ on average upward mobility in CZs for Black and White individuals separately. The outcome variable is average individual income rank by childhood CZ and parent income group. Due to data limitations, I am unable to separate Black descendants of Great Migrants versus descendants of northern Black residents. Thus, estimated effects should be interpreted as the average effect on these two groups. I am also only able to observe outcomes for those families who remained in destination CZs. This may be a concern due to reverse migration by Black Americans to the South after 1970. However, because of low migration rates during the years when the children in the sample were born (1978–1983), I do not believe these migratory patterns greatly influence the results. Finally, both Black and White families migrated from urban to suburban areas over the sample period. Because I examine outcomes at the CZ level, however, these within-metropolitan-area migrants are still included in the sample.[23]

Figure 8 summarizes the results from 2SLS regressions of the Migration's impact on race-specific upward mobility, where the shock has been scaled to represent a one standard deviation increase in the historical Black population. Black men face the largest reductions in individual income rank from having grown up in Great Migration CZs, and this is true for those with both low- and high-income parents. The effect on Black women with low-income parents is negative and statistically insignificant while the effect on Black women with high-income parents is positive and statistically significant at the 10 percent level.[24] I find smaller and statistically

[23] Note, the term "White" refers to non-Hispanic White individuals. It should also be noted that outcomes by subgroup from Chetty et al. (2020) are only available for geographic areas with a sufficient number of individuals from the subgroup so as to not compromise privacy. Data on Black individuals from Butte, MT is not available for this reason. Outcomes are available for the other 129 CZs in the sample.

[24] Large standard errors for those with high-income parents may reflect the small number of Black men and women with parents at the seventy-fifth percentile of the parent income distribution. In online Appendix Figure D2, I report results from regressions weighted by the number of individuals whose tax records underlie the upward mobility estimates. Results are qualitatively similar using weights, but the coefficient is smaller for Black women with high-income parents and larger for White men with low-income parents. Because the focus of the paper is on how the Migration alters *locations* as opposed to the average treatment effect on individuals, I report results from unweighted regressions in the main text. Online Appendix D, Section 3.1 reports results where regressions are instead weighted by the number of individuals underlying each CZ's upward mobility estimates.

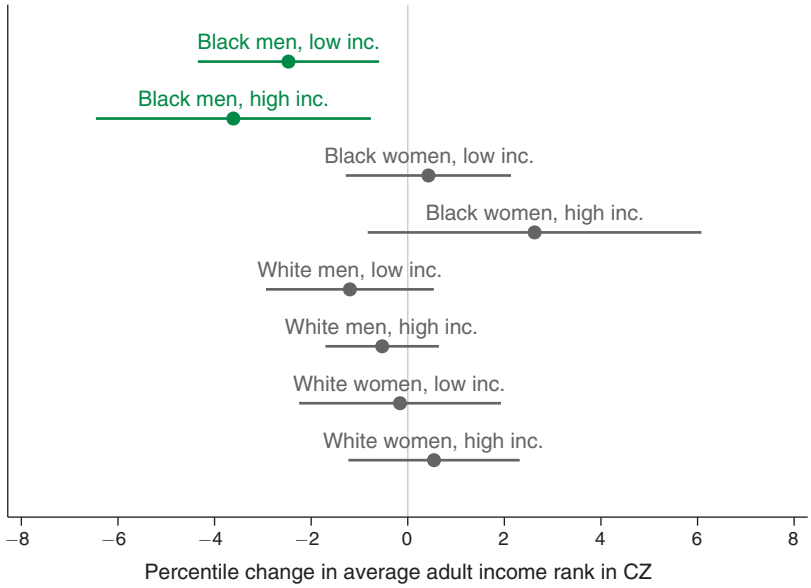


Figure 8. Race and Gender Heterogeneity in Impact of Great Migration on Upward Mobility

Notes: This figure plots coefficients from regressions of average upward mobility in the 2000s for men and women from low- and high-income parents on the instrument for Black population increases during the Great Migration, in approximately one standard deviation units. The unit of observation is a CZ. Upward mobility is defined as expected mean household income rank where income is measured from IRS tax returns for cohorts born between 1978 and 1983. Pooled income refers to mean household income rank, pooling across men and women. The instrument is the percentile of predicted Black population increase, defined as the interaction between pre-1940 Black southern migration patterns and post-1940 outflows of migrants as predicted by southern economic factors alone. A one standard deviation increase is approximately 30 percentiles. Baseline 1940 controls include the share of the urban population made up of 1935–1940 Black southern migrants, educational upward mobility, the share of the labor force in manufacturing, and census region fixed effects.

Sources: IPUMS complete count 1940 US census, Boustan (2016), Chetty et al. (2020)

insignificant effects on White men and women from low-income families, a small negative and statistically insignificant effect on White women from low-income families, and a small positive and statistically insignificant effect on White women from high-income families.

Tables 5 and 6 report the OLS, reduced form, and 2SLS results for each subgroup. Table 5 shows that a 1-percentile increase in the historical Black population lowers the income rank of Black men with low-income parents by 0.085 percentile points (standard error $=$ 0.033) (column 3), with larger effects on Black men with higher-income parents, who experienced reductions of 0.125 percentile points (standard error $=$ 0.050) (column 6). By contrast, in Table 6, I find a smaller and statistically insignificant negative effect on White men with low-income parents and an even smaller effect of the Migration on the individual earnings of White men with high-income parents. Tables 5 and 6 also report the effect of the Migration on household income by race, pooling across gender groups. A 1-percentile larger Migration shock lowered Black household income rank by 0.059 percentile points (standard error $=$ 0.026) for those from low income families. The effect on White households is smaller and statistically insignificant, at -0.026 percentile points (standard error $=$ 0.035).

Table 5—Great Migration Impact on Black Families

Panel A. First stage on GM						
$\widehat{GM}$	0.310	0.310	0.310	0.310	0.310	0.310
	(0.0741)	(0.0741)	(0.0741)	(0.0741)	(0.0741)	(0.0741)
F-stat	17.49	17.49	17.49	17.49	17.49	17.49
	Low income			High income		
	Pooled	Women	Men	Pooled	Women	Men
Panel B. OLS						
GM	−0.0563	0.0215	−0.0652	−0.0767	0.0356	−0.0894
	(0.00956)	(0.0110)	(0.0120)	(0.0147)	(0.0218)	(0.0181)
R^2	0.428	0.245	0.316	0.358	0.117	0.227
Panel C. Reduced form						
$\widehat{GM}$	−0.0183	0.00458	−0.0264	−0.0269	0.0281	−0.0386
	(0.00930)	(0.00976)	(0.0114)	(0.0140)	(0.0190)	(0.0169)
R^2	0.286	0.223	0.185	0.237	0.114	0.110
Panel D. 2SLS						
GM	−0.0591	0.0148	−0.0852	−0.0869	0.0906	−0.125
	(0.0260)	(0.0301)	(0.0330)	(0.0401)	(0.0608)	(0.0501)
Observations	129	129	129	129	129	129
Mean rank	0.332	0.403	0.389	0.453	0.493	0.515
St. dev. rank	0.0275	0.0276	0.0315	0.0398	0.0504	0.0448
St. dev. GM	28.80	28.80	28.80	28.80	28.80	28.80

Notes: This table reports the estimated impact of the Great Migration on average upward mobility in the 2000s for Black men and women born between 1978 and 1983. The unit of observation is a CZ. The dependent variable is expected mean income rank for those with parents at the twenty-fifth and seventy-fifth percentile of parent income. Income is measured from IRS tax returns. The independent variable is the percentile of Black population increase during the Great Migration. The instrument is the percentile of predicted Black population increase, defined as the interaction between pre-1940 Black southern migration patterns and post-1940 migrant outflows predicted by southern economic variables. Baseline 1940 controls include the share of the urban population made up of 1935–1940 Black southern migrants, educational upward mobility, the share of the labor force in manufacturing, and census region fixed effects. Standard errors are in parentheses.

Sources: CCDB, IPUMS complete count 1940 US census, Boustan (2016), Chetty et al. (2020)

How do the estimates for Black and White households compare to the estimates for all racial groups discussed in Section IVA? The direct effect of the Migration on the share of Black families at given parent income percentiles may introduce a "composition" effect in estimates of the Migration's impact on average upward mobility, making the effect on the latter larger than that on Black or White individuals separately. This composition effect stems from lower upward mobility for Black households than White across the United States, an effect of systemic disadvantage and nationwide factors affecting opportunity for Black families. In online Appendix D, Section 3.2, I directly estimate this composition effect and show that taking this effect into account reconciles the difference between race-specific and pooled upward mobility.[25]

[25] I also compare the population-weighted average of the Migration's effect on Black and White households to the impact on childhood exposure effects for all racial groups, the latter of which is purged of the composition

Table 6—Great Migration Impact on White Families

Panel A. First stage on GM						
$\widehat{GM}$	0.297	0.297	0.297	0.297	0.297	0.297
	(0.0759)	(0.0759)	(0.0759)	(0.0759)	(0.0759)	(0.0759)
F-stat	15.34	15.34	15.34	15.34	15.34	15.34
	Low income			High income		
	Pooled	Women	Men	Pooled	Women	Men
Panel B. OLS						
GM	−0.0155	0.00128	−0.0141	−0.0218	−0.00673	−0.0193
	(0.0120)	(0.0127)	(0.0103)	(0.00793)	(0.0105)	(0.00713)
R^2	0.284	0.252	0.269	0.374	0.371	0.280
Panel C. Reduced form						
$\widehat{GM}$	−0.00757	−0.00164	−0.0123	−0.00238	0.00558	−0.00542
	(0.0108)	(0.0113)	(0.00913)	(0.00726)	(0.00936)	(0.00651)
R^2	0.277	0.252	0.268	0.336	0.371	0.241
Panel D. 2SLS						
GM	−0.0255	−0.00551	−0.0413	−0.00802	0.0188	−0.0183
	(0.0350)	(0.0368)	(0.0306)	(0.0233)	(0.0312)	(0.0207)
Observations	130	130	130	130	130	130
Mean rank	0.452	0.405	0.490	0.606	0.517	0.630
SD rank	0.0316	0.0326	0.0267	0.0223	0.0295	0.0187
SD GM	28.98	28.98	28.98	28.98	28.98	28.98

Notes: This table reports the estimated impact of the Great Migration on average upward mobility in the 2000s for White men and women born between 1978 and 1983. The unit of observation is a CZ. The dependent variable is expected mean income rank for those with parents at the twenty-fifth and seventy-fifth percentile of parent income. Income is measured from IRS tax returns. The independent variable is the percentile of Black population increase during the Great Migration. The instrument is the percentile of predicted Black population increase, defined as the interaction between pre-1940 Black southern migration patterns and post-1940 migrant outflows predicted by southern economic variables. Baseline 1940 controls include the share of the urban population made up of 1935–1940 Black southern migrants, educational upward mobility, the share of the labor force in manufacturing, and census region fixed effects. Standard errors are in parentheses.

Sources: CCDB, IPUMS complete count 1940 US census, Boustan (2016), Chetty et al. (2020)

What explains the larger effects of the Migration on Black men compared to Black women? There are two potential explanations. Black women who marry men typically form households with Black men. Given that Black men's income is lower in Great Migration destinations, women may increase their labor supply to compensate for missing men's income, explaining negligible or even positive effects of the Migration on their earnings rank. Alternatively, family and environmental factors have been shown to have stronger effects on boys versus girls. Certain family characteristics, such as the presence of both parents in the household, have been shown to have much stronger effects on boys versus girls (Bertrand and Pan 2013). Other research has shown that boys' outcomes are also more elastic than girls' to other inputs as well, for example, school quality (Autor et al. 2016).

effects biasing the Migration's impact on average upward mobility. Given the confidence intervals, I cannot reject that the two effects are the same. Still, the magnitude of the estimated effect via childhood exposure is larger than the weighted-average of the effect on Black and White households. I discuss race-specific selection stories that may account for the differences in the magnitudes.

I explore these hypotheses in online Appendix Tables D7, D8, and D9, using data from the Opportunity Insights website,[26] which provides tabulated statistics of family structure and labor market outcomes by race, gender, and parent income group at fine geographic levels. I do not find evidence that the Migration increased Black women's propensity to report positive earnings or work greater hours. At the same time, I find strong evidence that the Migration is associated with lower father presence for Black men and women from all parent income groups. Finally, I find that the educational outcomes of Black men from low income families are worse in CZs with higher historical Black migration, but this is not the case for Black women. These results point towards the greater responsiveness of boys' outcomes to family and environmental factors as a potential explanation for the Migration's more negative effect on Black men.

Implications for the Racial Gap.—The fact that Black children have lower household incomes as adults, but White children are less affected by the Migration has implications for the racial gap in income upward mobility in the United States. In this section, I conduct a counterfactual exercise to quantify the contribution of the Great Migration to the gap in upward mobility between Black and White individuals with low-, median-, and high-income parents.

The counterfactual seeks to address the following question: what would the racial gap in upward mobility in the North be without the changes induced by the Great Migration? I define the counterfactual as one in which Black families grow up in locations that receive the lowest percentile of shock.[27] I compute the average racial gap under this counterfactual and compare it to the observed average racial gap in the region.[28]

The results are reported in Table 7.

Table 7—Great Migration Contribution to Northern Racial Upward Mobility Gap

	Parent income		
	25th percentile	50th percentile	75th percentile
Observed	12.03	13.45	15.30
CF without GM (SE)	9.10 (3.12)	9.83 (2.76)	11.01 (2.63)
Percent change	−24%	−27%	−28%

The first row reports the average observed racial gap, ranging from 12.03 income rank percentiles for individuals with parents at the twenty-fifth percentile to 15.30

[26] Available at https://opportunityinsights.org/.

[27] Alternatively, I can compute counterfactual upward mobility for both Black and White families and take the difference. The point estimate for the Migration's effect on White men is negative but close to zero, and this approach ignores the fact that the effect is statistically insignificant. Taking this effect on White families as the true effect, the gap in upward mobility for individuals growing up in median-income families is 21 percent rather than 27 percent.

[28] The standard error for the counterfactual racial gap at a given parent income percentile equals the square root of the sample variance of the counterfactual racial gap, or $\frac{1}{N_c}\sum_{c=1}^{N_c}(RG_{c,p}^{cf} - \overline{RG}_{c,p}^{cf})^2$, where N_c is the number of CZs in the sample, $RG_{c,p}^{cf}$ is the counterfactual racial income rank gap in commuting zone c for individuals with parents at income rank p, and $\overline{RG}_{c,p}^{cf}$ is the mean of the counterfactual gap across the CZs in the sample.

Table 8—Robustness of Effects of Childhood Exposure to Great Migration CZs

GM (2SLS)	−0.00538	−0.00574	−0.00871	−0.0111	−0.00982	−0.00828	−0.00848	−0.00867
	(0.00174)	(0.00118)	(0.00279)	(0.00400)	(0.00318)	(0.00255)	(0.00277)	(0.00275)
First stage F-stat	23.34	64.01	17.27	13.46	14.60	20.71	16.96	17.80
GM (OLS)	−0.00324	−0.00313	−0.00256	−0.00253	−0.00259	−0.00261	−0.00253	−0.00264
	(0.000669)	(0.000667)	(0.000848)	(0.00108)	(0.000860)	(0.000867)	(0.000848)	(0.000861)
R^2 (OLS)	0.158	0.211	0.224	0.256	0.224	0.225	0.233	0.226
Observations	130	130	130	130	130	130	130	130
Precision weight	Y	Y	Y	Y	Y	Y	Y	Y
Census div. FE	N	Y	Y	Y	Y	Y	Y	Y
Baseline controls	N	N	Y	Y	Y	Y	Y	Y
1940 Black share quartile FEs	N	N	N	Y	N	N	N	N
Southern mob	N	N	N	N	Y	N	N	N
White South migrants	N	N	N	N	N	Y	N	N
European migrants	N	N	N	N	N	N	Y	N
Employment Bartik	N	N	N	N	N	N	N	Y

Notes: This table reports robustness of the estimated impact of the Great Migration on childhood exposure effects to several alternative specifications. The unit of observation is a CZ. The dependent variable is childhood exposure effects in the 2000s for men and women with low-income parents. Childhood exposure effects are the estimated causal impact of one additional year of childhood in the CZ on adult household income rank for men and women with parents at the twenty-fifth percentile of the parent income distribution. Income is measured from IRS tax returns for cohorts and parents of cohorts born between 1980 and 1986. Pooled income refers to household income, pooling across men and women. The independent variable is the percentile of Black population increase during the Great Migration. The instrument for Black population increase is the percentile of predicted Black population increase, defined as the interaction between pre-1940 Black southern migration patterns and post-1940 outflows of migrants as predicted by southern economic factors alone. Baseline 1940 controls include the share of the urban population made up of 1935–1940 Black southern migrants, educational upward mobility, the share of the labor force in manufacturing, and census region fixed effects (FE).

Sources: IPUMS complete count 1940 US census, Boustan (2016), Chetty and Hendren (2018b)

income rank percentiles for individuals with parents at the seventy-fifth percentile. The second row reports the counterfactual average gap where northern Black families experience the lowest percentile of Great Migration shock. Under this counterfactual, the average racial gap across northern CZs ranges from 9.10 percentiles (standard error = 3.12 percentiles) for individuals with low-income parents to 11.01 percentiles (standard error = 2.63 percentiles) for individuals with high-income parents. These estimates suggests the Migration increased the racial gap by 24 percent for low-income families, 27 percent for median-income families, and 28 percent for high-income families.

C. *Alternative Explanations*

I examine numerous alternative explanations for the negative association between the Great Migration and upward mobility in destinations. Results from these robustness checks are reported in Tables 8 and 9, and additional details are provided in online Appendix D, Section 6.

Deindustrialization.—Many Black southerners were drawn north by manufacturing jobs in cities like Gary, Detroit, and Baltimore. These once booming industrial centers subsequently underwent devastating job loss, with the United States losing two million manufacturing jobs between the 1970s and 2000 (Charles, Hurst, and Schwartz 2019). In all specifications, I control for the share employed in

Table 9—Robustness of Great Migration's Effects on Black Men's Upward Mobility

GM (2SLS)	−0.100	−0.0769	−0.0852	−0.0689	−0.0819	−0.0845	−0.0816	−0.0994
	(0.0242)	(0.0191)	(0.0330)	(0.0432)	(0.0376)	(0.0320)	(0.0358)	(0.0368)
First stage F-stat	31.09	43.54	15.34	10.30	12.14	18.56	13.02	12.90
GM (OLS)	−0.0614	−0.0648	−0.0652	−0.0488	−0.0639	−0.0656	−0.0640	−0.0741
	(0.0104)	(0.0103)	(0.0120)	(0.0136)	(0.0122)	(0.0125)	(0.0122)	(0.0124)
R^2 (OLS)	0.227	0.279	0.316	0.354	0.318	0.316	0.318	0.344
Observations	129	129	129	129	129	129	129	129
Precision weight	Y	Y	Y	Y	Y	Y	Y	Y
Census div. fixed effects	N	Y	Y	Y	Y	Y	Y	Y
Baseline controls	N	N	Y	Y	Y	Y	Y	Y
1940 Black share quartile fixed effects	N	N	N	Y	N	N	N	N
Southern mob	N	N	N	N	Y	N	N	N
White South migrants	N	N	N	N	N	Y	N	N
European migrants	N	N	N	N	N	N	Y	N
Employment Bartik	N	N	N	N	N	N	N	Y

Notes: This table reports robustness of the estimated impact of the Great Migration on Black men's upward mobility to several alternative specifications. The unit of observation is a CZ. The dependent variable is expected mean individual income rank for individuals with parents at the twenty-fifth percentile of the parent income distribution. Income is measured from IRS tax returns for cohorts and parents of cohorts born between 1978 and 1983. The independent variable is the percentile of Black population increase during the Great Migration. The instrument for Black population increase is the percentile of predicted Black population increase, defined as the interaction between pre-1940 Black southern migration patterns and post-1940 outflows of migrants as predicted by southern economic factors alone. Baseline 1940 controls include the share of the urban population made up of 1935–1940 Black southern migrants, educational upward mobility, the share of the labor force in manufacturing, and census region fixed effects.

Sources: IPUMS complete count 1940 US census, Boustan (2016), Chetty et al. (2020)

manufacturing in 1940, which largely accounts for the manufacturing shares in subsequent decades. I also instrument for employment changes in the destination CZs using a Bartik demand shock. Including this demand shock as a control does not greatly alter the magnitude or precision of my estimates (see column 8 of Tables 8 and 9). I also find muted effects of the Great Migration on White men from low-income families, a demographic group likely to be strongly affected if the findings were driven by deindustrialization alone. Lastly, Black men from higher-income families in Great Migration CZs also fare worse than those from locations with less historical Black in-migration, inconsistent with a shock only affecting families with manufacturing workers.

Other Migrations.—It's possible that the effect of the Great Migration confounds the loss of European immigrant labor supply during World War I and after the Immigration Acts of the 1920s, which induced these areas to begin hiring Black workers from the South. I control for historical European immigration in column 7 and do not find evidence of this driving my findings. White southern migration was also significant during the Great Migration. I construct a shift-share instrument for White southern migration into destination CZs and find this has no impact on childhood exposure effects. Online Appendix Figure D14, panels (a) and (b), show the reduced form relationship between White southern in-migration and Black men's outcomes in binned scatterplots. The relationship is insignificant and the coefficient has the opposite sign as the effect of Black population increases. The main results on upward mobility are also robust to including predicted White southern migration

as a control; the main coefficient on the Great Migration is similar in magnitude and precision (see column 6 of Tables 8 and 9).

Selection of Migrants and Fixed Characteristics of CZs.—I show in online Appendix Figures C2 and C3 that Black southern migrants had high levels of education relative to Black southerners overall, and the children of Black southerners tended to remain in school longer than those from incumbent Black households in the North. This belies the notion that Black migrants from the South were negatively selected in terms of education or investment in children. I also construct a measure of Black southern upward mobility in northern CZs by taking the migrant-share-weighted average of county-level upward mobility for Black families in the South in 1940. Detroit's measure strongly reflects upward mobility patterns in Alabama, while Baltimore's strongly reflects those in Virginia (see online Appendix Figure C1 for the distribution of migrant origin locations across major destination cities). If the Migration's primary effect was through increasing the share of Black southerners, then including this measure as a control should attenuate the Migration's effect on upward mobility. I show that this is not the case in column 5 of Tables 8 and 9.

Finally, results are also highly robust to including flexible controls for the Black population share in 1940 (see column 4 of Tables 8 and 9).[29] In online Appendix Figure D15, I also show consistent results using a first-differenced specification where the main outcome is the difference between standardized educational upward mobility for Black boys in 1940 and standardized income upward mobility for Black men in the 2000s. This evidence supports the notion that the Migration's impacts are not driven by fixed characteristics of the CZs in the pre-1940 period.

V. Evidence on Local Mechanisms

Why did the northern United States cease to be a land of opportunity for Black families in the wake of the Great Migration? The historical and sociological literatures on urban crisis point to the role of White flight combined with declining economic opportunity in the urban core. Wilson (1987) highlighted the importance of economic factors: reduced prospects for Black men in the labor market, and subsequently in the marriage market, contributed to increased crime and the rise of single households headed by women. Sugrue (1996) also points to the confluence of the isolating effects of urban segregation and a long trend of manufacturing jobs relocating out of predominantly Black central cities into White suburban and rural locations.

Contemporaneous government reports also attest to the extreme inequality in US cities in the 1960s. The 1968 *Report of the National Advisory Commission on Civil Disorders*, popularly known as the Kerner Commission Report (Kerner 1968), analyzed the riots occurring in major cities at the time and concluded that they were the culmination of decades of segregation, discrimination, and racial inequality. Despite the fact that the Black population made up a majority of the urban population in several northern cities, Black residents largely lived in cities

[29] For Black men's upward mobility, the coefficient attenuates, and I lose precision; however, the point estimate is still negative and sizable.

with all-White governments and interacted with all-White police forces, escalating racial tensions in the North.

Guided by this historical and sociological literature, I focus my analysis on rising segregation, racial tensions, urban decline, and the policy choices of local governments as plausible mechanisms. I assembled a database on these outcomes for urban northern CZs, spanning the period 1920–2015. Details on the specific measures and the construction of this database are in Online Appendix E.

I estimate the following reduced form relationship between historical Black in-migration and local mechanisms:

$$M^t_{CZ} = \eta + \mu \widehat{GM}_{CZ} + \mathbb{X}'_{CZ}\phi + \nu_{CZ}, \tag{11}$$

where t refers to the period the mechanism is measured, and M refers to the mechanism of interest. I standardize all mechanism variables and scale the Migration shock $\widehat{GM}_{CZ}$ so that the units are one standard deviation. I estimate the effect of the Great Migration on average pre-1940 mechanisms (1920–1940) to check for trends prior to the wave of migration I focus on and average postperiod (1970–2015) mechanisms to assess the long-run impacts of the Migration.

Figure 9 summarizes the results from this analysis. Panel A of Figure 9 documents the lack of a pretrend across a large number of potential mechanisms, suggesting that the Migration shifted the nature of the urban environment in key ways. I find no clear association between the Migration and the share of all public spending in a CZ allocated to education or police, private school enrollment rates, or incarceration rates in CZs. I do find that the Migration is associated with higher average urban murder rates across 1931 and 1943, potentially due to the Migration's greater incidence in more urbanized areas of the non-South. I control for these early period murder rates when analyzing the post-1970 period. I also show in online Appendix Figures D11 and D12 panels (a) and (b) that the impact of the Migration on childhood exposure effects of CZs today and on Black men's upward mobility is robust to controlling for pre-1940 murder rates.

Panel B of Figure 9 shows the effect of the Migration on mechanisms in the post-1970 period. Analysis of various measures of neighborhood quality suggest that urban decline followed the Great Migration. Destinations exhibit higher murder rates, and local governments increased investment in police (measured as police per capita and the share of public spending allocated to police) and incarcerated at higher rates. I find suggestive evidence that destinations are more segregated by income and exhibit greater economic sprawl, though the effect is not statistically significant. Compared to locations less affected by the Migration, destination CZs remain more racially segregated as indicated by opposite effects on White and Black private school enrollment (with a highly statistically significant effect on the gap) and residential segregation.

By contrast, I see no systematic reallocation of spending towards or away from other types of spending over which local governments exercise discretion.[30] There is no statistically significant impact of the Migration on educational expenditures

[30] Online Appendix Table E1 provides a breakdown of local, state, and federal contributions to different public spending categories.

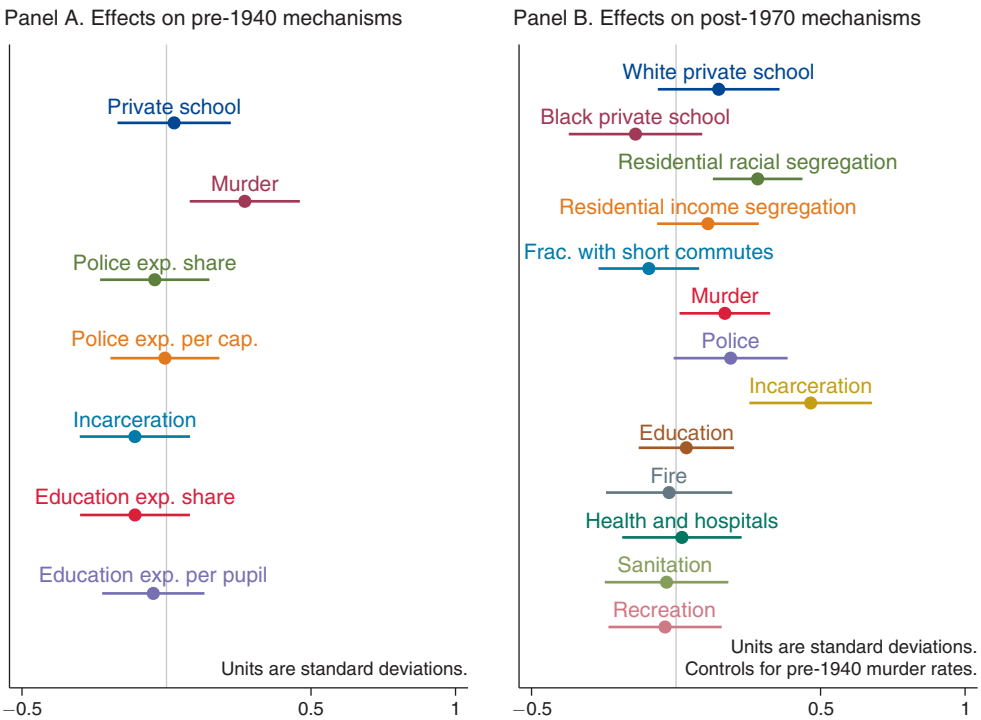


Figure 9. Great Migration CZs Have Higher Segregation, Crime, and Policing

Notes: This figure plots the coefficient on the instrument for Black population increases during the Great Migration, in approximately one standard deviation units, in separate regressions. The unit of observation is a CZ. The dependent variables in panel A are standardized 1920 private school enrollment rates, mean 1931–1943 urban murders per 100,000 of the urban population, mean 1920–1940 local jail rate per 100,000, and mean government expenditure shares and per capita or per pupil spending. The dependent variables in panel B are standardized mean 1970–2000 White and Black private school enrollment rates, the Theil indices in residential racial and income segregation in 2000, the fraction of families in 2000 with commute times of less than 15 minutes, mean 1977–2002 murders per 100,000 of the population, mean 1983–2000 incarcerated per 100,000 of the population, and mean 1972–2002 government expenditure shares by category. The instrument is the percentile of predicted Black population increase, defined as the interaction between pre-1940 Black southern migration patterns and post-1940 outflows of migrants as predicted by southern economic factors alone. A one standard deviation increase is approximately 30 percentiles. Baseline 1940 controls include the share of the urban population made up of 1935–1940 Black southern migrants, educational upward mobility, the share of the labor force in manufacturing, and census region fixed effects. Panel B includes controls for the average 1931–1943 murder rate.

Sources: IPUMS complete count 1940 US census, Boustan (2016); see online Appendix E for the full list of data sources on each of the mechanisms

per pupil or on the share of total spending by local governments in the CZ devoted to education. The standard errors are large, however, and these aggregate effects may mask differences or reallocation across local governments within CZs. For example, school spending may have decreased in urban school districts and simultaneously increased in suburban school districts. Private school enrollment rates tend to be higher in urban areas, which may indicate lower quality in urban public school districts. Further analysis utilizing individual school district data is needed to test whether this reallocation within CZs explains the null results on education. Finally, a lack of an increase in education spending may be telling in and of itself. If the Migration increased the share of children coming from disadvantaged educational

environments, one might expect responsive local governments to increase investments in education rather than keep spending at the same level.

In online Appendix F, I conduct a year-by-year analysis of the Great Migration's effects on local mechanisms, and show that segregation worsened over the course of the Migration (see online Appendix Figure F2) while the 1960s marked an important turning point for policing, incarceration, and crime in destination CZs (see online Appendix Figures F3, F7, and F9).

To understand the underlying context, I also explored racial tensions and attitudes in the destinations during this period. White residents exhibited more racially conservative attitudes in major Great Migration destinations, as measured by their support for segregationist presidential candidate George Wallace in 1968 (see online Appendix Table F1). I find suggestive evidence of persistent racial animus in northern Great Migration CZs, based on Google search trends data (see online Appendix Figure F10). Rising racial tensions in cities across the United States erupted in major riots in the late 1960s, and these riots were of greater intensity in Great Migration cities, lasting longer and involving more injuries and arrests (see online Appendix Table F2).

Finally, I assess the extent to which sorting within CZs contributes to disparate outcomes for Black and White individuals growing up in destination locations. The Migration's negative effects on upward mobility are indeed concentrated in urban areas as opposed to non-urban areas in the CZ (see online Appendix Figure D3). At the same time, segregation and sorting into different locations within a CZ is not the only mechanism through which the Migration worsened Black outcomes. I compute the census-tract-level racial gap in income for Black and White men from across the parent income distribution and estimate the impact of the Migration on the population-weighted average within-census-tract racial gap. The within-census-tract racial gap is larger in Great Migration destinations, suggesting that Black boys in predominantly White neighborhoods face a different effective environment than their White counterparts. The criminal justice system, for example, may disproportionately affect Black boys, no matter the neighborhood in which they reside. Online Appendix Figure D4 reports these results.

A. *Discussion of Local Mechanisms*

The results above point to a role for segregation, reallocations of government spending, and urban decline through rising crime as potential mechanisms for the Migration's effect on upward mobility. However, I am limited in my ability to identify the relative importance or contribution of these individual mechanisms. Doing so would require additional natural experiments or instruments to separately estimate each mechanism's causal effect, which is beyond the scope of this paper. Still, the economics and sociological literatures suggest these local changes are likely to have played a role in worsening racial inequality in destination CZs.

A large literature—too large to be summarized in full here—documents the negative effects of segregation on outcomes and racial inequality.[31] Other studies find positive effects on neighborhood outcomes and earnings and lower rates of incarceration for

[31] A noncomprehensive list includes Massey and Denton (1993), Ananat (2011), Andrews et al. (2017), Chetty et al. (2014), and Chetty et al. (2020).

Black children exposed to school desegregation, suggesting that policies encouraging integration may mitigate negative responses to the Great Migration (Tuttle 2019, Johnson 2019). Exposure to crime increases individual criminal behavior, which has consequences for one's probability of incarceration and traditional employment (Case and Katz 1991, Damm and Dustmann 2014, Heller et al. 2017, Sviatschi 2020). Crime and residential racial segregation are highly correlated across urban areas, which suggests that Black children are disproportionately exposed to crime and violence compared to White children growing up in the same CZs. Childhood exposure to higher crime rates may thus directly reduce Black men's income upward mobility relative to their White counterparts in Great Migration cities.

In light of this, effective criminal justice policy may be a solution. Norris, Pecenco, and Weaver (2021) find evidence of deterrence effects of sibling incarceration on criminal justice outcomes in Ohio.[32] Sharkey and Torrats-Espinosa (2017) find that crime decreases upward mobility, using increased funds for community policing as an instrument; thus indicating that certain forms of policing improve upward mobility through reduction in crime. At the same time, a growing literature points to negative spillovers of the criminal justice system on and discrimination against Black communities. Rising incarceration has increased Black-White inequality (Western 2006). Ang (2021) finds that police-involved shootings of civilians have deleterious effects on the Black and Hispanic students' educational outcomes in the same neighborhood. Chalfin et al. (2020) show that while increased policing reduced violent crime, it also increased arrests for nonviolent offenses with disproportionate effects on Black Americans. Finally, Liu (2020) documents mass incarceration's effects on Black families, suggesting deleterious effects on the family structure and educational outcomes.

More work is needed to disentangle the relative importance of each of these potential mechanisms. One path forward is to identify and exploit exogenous variation in White flight, policing, criminal justice policy, and education policy across locations to separately identify the Migration's impact on these factors.

B. *Discussion of the Aggregate Effects of the Migration*

An important question this paper abstracts from is the aggregate effect of the Great Migration on Black economic status, including the South. In a simple counterfactual exercise conducted in online Appendix D, Section 5, I explore these aggregate effects by plotting intergenerational mobility curves by race and region, including the counterfactual curve for Black families in the North had the Migration not taken place. The latter is shifted up based on the estimated negative effect of the Migration on Black children with different parent incomes. I conclude that while the Migration likely did reduce gains to parent income for Black children in the North—a downward shift in intergenerational mobility—only 23 percent of Black children would have enjoyed those higher gains in the absence of the Migration. This combined with the Migration's large positive effect on grandparent income, which moved Black children *up* the intergenerational mobility curve, is likely to

[32] By contrast, Dobbie et al. (2018), studying Sweden, finding that parental incarceration increases teen crime and pregnancy and lowers subsequent employment for youths from disadvantaged families.

have resulted in a net positive gain. Any positive impacts of Black emigration from the South, which improved in upward mobility in the late twentieth century, would only magnify this positive effect.

VI. Conclusion

Over the twentieth century, Black Americans engaged in perhaps the largest natural experiment in "moving to opportunity" in US history. This unique episode in history provides a setting to test the general equilibrium effects of families moving to locations with better average outcomes, the basis for many popular anti-poverty policies today.

Using exogenous variation in the extent to which northern locations became destinations during the Great Migration, I show that racial composition changes during this period ultimately reduced northern cities' ability to promote positive outcomes for today's cohorts, especially for Black men growing up in affected locations.

In response to mid-century increases in the Black population share, White families withdrew from shared public schools and urban neighborhoods, leading to persistent educational and residential segregation. Starting in the 1960s, the quality of the urban environment in destinations sharply deteriorated, with severe race riots and higher urban crime. Local governments increased public spending on police in both absolute and relative terms, remaining differentially invested in policing over the next several decades. Although certain forms of policing have been shown to benefit intergenerational mobility, a number of studies also document negative effects of greater police presence on the outcomes of Black students.

At the height of rising incarceration in the 1980s and early 1990s, major Great Migration destinations sent substantially more of the Black population to federal and state prison than locations less affected by the Migration. Cohorts growing up in the 1960s and 1970s would have been particularly at risk for incarceration. Many studies show that contact with the criminal justice system reduces Black men's employment prospects and increases the prevalence of single-parent families, effects that may propagate to future generations. Further research will have to disentangle the long-run impact that increased crime, the race riots of the 1960s, and local governments' responses to each have had on Black men's outcomes. A key question is whether alternative strategies for reducing racial inequality in cities can be identified given the sizable gaps under the existing set of policies.

My findings have important implications for policies that incentivize families to move to opportunity and, in particular, the limitations of scaling such programs. They may also have implications for responses to economic and political migration into Europe and ethno-nationalist backlash. During the Great Migration, millions of Black migrants moved North to improve their economic outcomes, and in response, northern cities changed in ways that eventually shuttered Black economic progress. These results highlight the importance of understanding the specific mechanisms through which locations facilitate or inhibit intergenerational mobility, particularly for marginalized groups. In light of the sensitivity of location effects to large shifts in population composition, more concerted efforts aimed at reducing disparities within locations, rather than relocating disadvantaged families, may be warranted.

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